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April, 1945

GEORGE C. MERCER: THE PURCHASING AGENT'S PART IN THE POST-WAR PLAN

See page 71

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CONOVER-MAST PUBLICATION . 35



OUNTING a 90-mm. gun firing a 24-lb. projectile that can pierce heavy armor, the Army's M-36 gun motor carriage is the deadliest tank destroyer ever built. Operated by a five-man crew, this 31-ton "giant killer" travels 30 mph., crosses 7½-ft. trenches, fords small streams and climbs steep grades.

Building tank destroyers and other weapons of war in the huge quantities required today can be accomplished only through efficient mass production methods. This, in turn, depends largely on effective lubrication of plant machinery—assured with Texaco Products and Texaco Specialized Engineering Service.

Texaco performance, preferred in many fields, can definitely increase production in your plant, too.

Texaco Lubrication Engineering Service is available through more than 2300 Texaco distributing plants in the 48 States. Get in touch with the nearest one, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

RECONVERSION RUSTPROOFING

5 Points to Remember

- 1 Upon termination of war contracts, Government-owned production equipment must be rustproofed promptly, in accordance with official instructions.
- Ordnance Specification P.S. 300-4 contains official instructions for the complete processing of such equipment.
- These instructions require that only rustproofing materials meeting Government specifications be used.
- Texaco rustproofing products meet Ordnance specifications for application on Government-owned equipment.
- For full information, see your Texaco representative or write to us.

Engineering Service

JAMES MELTON EVERY SUNDAY NIGHT - CBS

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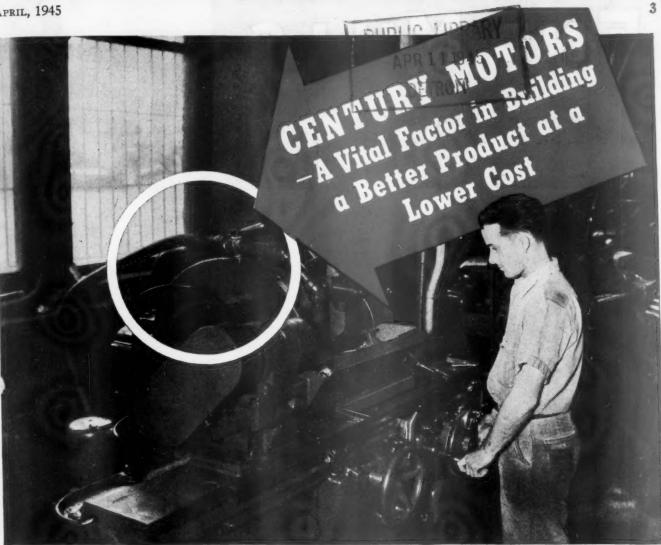
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Century 7½ horsepower squirrel cage, totally enclosed, fan cooled motor driving a grinder.

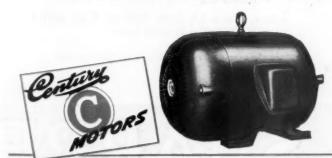
ne of the vital factors in building better products at lower cost is the accuracy and dependability of the production machines —the lathes, grinders, drill presses, milling machines, boring machines, etc. There is where Century Motors aid in solving Industry's No. 1 Problem.

Century Motors' unusual freedom from vibration contributes to the accuracy of the machines they drive, resulting in higher quality of parts produced, fewer rejects, and greater production at lower cost.

Century Motors are today proving, and will continue to prove the sound value of such design features as—accurate machining and balance, rugged frames, extreme rigidity, accurately machined feet, end bumpers of unique design, and many others.

If you have a problem involving any electric motor application, call in a Century engineer.

Century Motors are built in a wide variety of sizes and types from 1/6 to 600 horsepower.



421

CENTURY ELECTRIC COMPANY . 1806 Pine Street St. Louis 3, Missouri Offices and Stock Points in Principal Cities



BROWN & SHARPE BILL CUTTERS

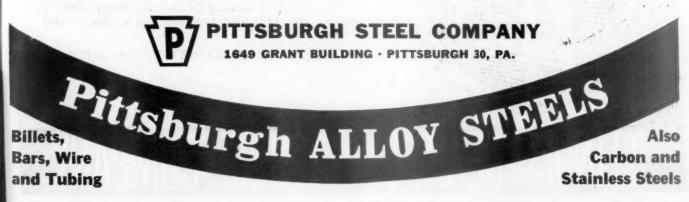


From long mastery of the art of making good open-hearth steel, plus new practices and experience given impetus by war demands, Pittsburgh Steel Company has developed the production of open-hearth alloy steel to a degree of perfection never before obtainable. When converted into Seamless Tubing the finished product is equal in quality to comparable grades made by other processes.

Sound steel plus the alloying "knowhow," and complete uniformity of analysis, heat treatment and response, gives this Pittsburgh Alloy Tubing a utility range limited only by imagination. Wider use in aviation, automotive, marine, processing and other applications seems a certainty.

Demonstrating the high quality obtainable with these open-hearth alloys, orders for Pittsburgh Alloy Tubing to Magnaflux specifications have been filled without difficulty.

Send us your "specs" for analysis and recommendation.



AP



Progress inspection—checking accuracy of tooth spacing and clearance on a spur gear.

Do Gears Have a Personality?

Probably not, but they do reflect the personality of their maker. They can be easy to order, however complex they may be, if the order-taker is competent and experienced. They can be doubly inspected—checked in the machine shop and again before shipping. They can be made under the inflexible supervision of "old timers." They can show a lot of finishing touches that show the maker really cares.

We strive to have our gears reflect the personality of such an organization.

The Illinois Gear trademark on every gear you buy means it's a "Five Star Gear", * The material has been carefully double-checked, * The gear has been cut by a highly skilled craftsman. * Required accuracy has been inbuilt. * The gear has been double-inspected after completion. * Delivery is as promised.

May we send Catalog 39 showing many types of gears, our production facilities and giving helpful engineering data?

ILLINOIS GEAR & MACHINE CO., Chicago (35), III.

The mark on Finer Gears

ILLINOIS GEAR & MACHINE COMPANY



Gear Up your GEAR FINISHING

Brushing Technique Illustrated Cut the Time on One Job from 21/2 HOURS to less than 3 MINUTES!

THIS is the case history of one of America's greatest airplane engine manufacturers.

Rounding the edges of gear teeth, very vital, took a lot of time. In many cases, the job had to be done by hand. High-speed portable pneumatic tools were also used—but great dexterity was required, and even the most skillful worker found noticeable variations in his work. A moment of carelessness could easily ruin a costly gear.

Solution: Power-driven tampico brushes, used with the installation illustrated, bear uniformly against the various edges. They can be adjusted to suit the diameters of different gears, and tilted at any angle to cover all surfaces. Abrasive compound is held above each brush, applied to the wheel by a

cam-operated device, driven by a separate small motor.

Isn't there an idea here for you to consider in connection with your new products?

Whatever they are, whether metal, plastic or fabric, it will pay you to consider Osborn brushes and Osborn-developed brushing techniques—which can, help you make your product look better, perform better and sell better, all at a lower unit cost.

Investigate without obligation. Contact Osborn and an expert field engineer will make a study of your operation or plans and submit specific recommendations.

THE OSBORN MANUFACTURING COMPANY
5401 Hamilton Avenue Cleveland, Ohio

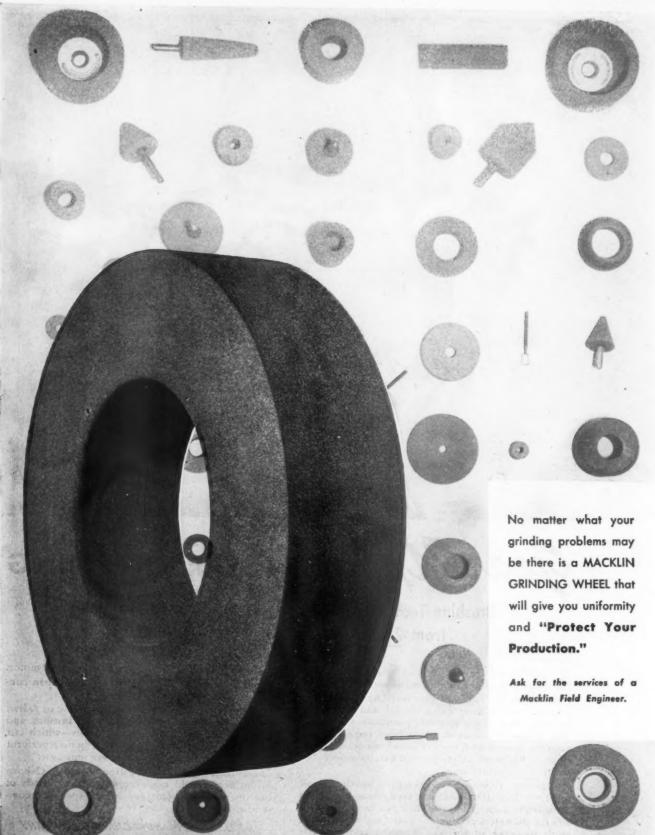




WORLD'S LARGEST MANUFACTURER

OF BRUSHES FOR INDUSTRY

APP



MACKLIN COMPANY

Manufacturers of GRINDING WHEELS — JACKSON, MICHIGAN, U.S.A.

Distributors in all principal cities

Sales Offices: — Chicago - New York - Detroit - Pittsburgh - Cleveland - Cincinnati - Milwaukee - Philadelphia

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ment • Operations • Periscopes are built with precision. So is J&L Wire Rope. Safety of human life . . . protection of equipment . . . maintenance of operations . . . depend on the quality of the wire rope you use. To give you the greatest protection . . . J&L builds wire rope with precision . . . from J&L Controlled Quality Steel . . . by men of skill and experience . . . on machines of the latest design . . . and pre-forms it for greater efficiency and resistance to fatigue.

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

PITTSBURGH 30. AND MUNCY. PENNSYLVANIA

PRECISIONBILT PRE-FORMED WIRE ROPE

"Know-How" Information

☐ 1. METAL CUTTING MANUAL—Sparton hack saws and band saws are described in this 40-page pocket type manual. It gives data on types, sizes and pitch; and contains practical use charts on hand blade sizes, power blades Instruction Chart, and other data buyers will find of value, on blades for cutting metal, plastics and wood. Sparton Saw Works, Inc.

□ 2. GAS WELDING AND CUTTING — The new Victor Gas Welding and Cutting Apparatus catalog—104 pages—is α comprehensive, well illustrated (in color) issue. Here you will find data on parts and complete units, cutting equipment, fittings, low pressure welding and cutting torches, regulators, tip selection chart, and welding torches, tips, nozzles. Victor Equipment Co.

☐ 3. GRINDING WHEELS — If you buy grinding wheels, you will have use for Grinding Wheel Data Book and Supplement and Standard Marking Folder and Chart. This combination presents information that is essential for making the selection, buying, and using of Abrasive Grinding Wheels easier and more convenient. Booklets Nos. ESA 73, ESA 72, and ESA 52-5. Abrasive Co.

☐ 4. FOUNDRY & MACHINE FACILITIES
—New 64-page catalog is a picture story of
the facilities and diversified products of
the Continental Foundry & Machine Co.
Two sections illustrate types of steel castings and rolling mill equipment and special
machinery produced.

☐ 5. NAME PLATES — Four-page folder illustrates character of nameplate work done by Etching Company of America.

Pictures show variety of designs and color combinations.

☐ 6. HARD FACING, Weldors — Guide — Successful hard facing by welding im a matter of application of the proper technique of application, states "Weldor Guide to Successful Hard Facing", a 30-page pocket-type booklet available from the Mir-O-Col Alloy Co. Subject matter includes Hard Facing, Effect of Heat on Metals, Acetylene Process, Electric Process, Hard Facing Crusher Jaws, Hard Facing Grader Blades, Mir-O-Col, and Suggested Applications.

☐ 7. TAP EXTRACTORS — Bulletins describe Walton Tap Extractors and Walton Salvage Service for removing broken taps, drills, screws, studs and reamers. Company advises that priority rating is unnecessary for extractors. The Walton Co.

■ 8. FLOATING DISC CLUTCH — Bulletin and Catalog No. 4 describes Maxitora floating disc clutch, which manufacturer states makes for easily controlled clutch engagement by light pressure, and reduction in shipper sleeve groove wear by the use of non-metallic shoes. Drag is eliminated when in neutral. Both single and double types are furnished with wet or dry disc construction, in several sizes. The Carlyle Johnson Machine Co.

□ 9. MULTI-SWIVEL VISE — This tool is described as a rugged unit combining strength and accuracy, and a vise of many uses with or without swivel. All parts are interchangeable. Platen, which is designed as optional accessory is said to greatly increase the usefulness of the unit where dies or irregular parts are to be machined.

Circular describes the vise in detail.

Master Tool Co.

☐ 10. GROUND FLUTE REAMERS — Circular describes L&I Ground Flute Reamers which are ground on both faces after hardening. Uniform hardness is said to be assured as the stock is heat treated in bar form. Being ground from the solid, L&I reamers are said to make it possible to control the uniformity and accuracy of all dimensions to the highest accuracy. They are lapped after grinding. Lavallee & Ide Inc.

☐ 11. WIRING ACCESSORIES—Wiremold Catalog and Wiring Guide No. 16A contains complete, up-to-the-minute information on Wiremold Surface Raceway Systems and allied products. Large assortment of fittings, including pancake, plugmold and wall case units are illustrated and described. The Wiremold Co.

☐ 12. WORTHWHILE IDEAS — "Backgrounds" is an unusual company publication issued by Pratt & Whitney, to record some of the remarkable contributions to human progress made possible by modern tools. Vol. III No. 2, is featuring "Tool Shop"—a Game of Wits and "Know How" on planning a tool shop, based on 1 — The Architect's Plan; 2 — The Selection of Equipment; 3 — The Shop Layout, and "Listen to the Kibitzers". It is accompanied by a worksheet so you can jot down ideas for best office arrangement, shop layout, and so on. Check No. 12 so you may receive "Backgrounds" regularly. Pratt & Whitney Divn.

☐ 13. BELTING CHART — Informative transmission and conveyor belting chart which provides rapid reference for standard belt thicknesses and includes full infomation as to fastener and lacing sizes for each thickness, is available from Baldwin Belting, Inc. All commonly used belting materials covered.

☐ 14. PHOSPHOR BRONZE — Catalog of 12 pages describes various grades of Seymour Phosphor Bronze, presenting sizes, specifications, tempers, tolerance, properties and uses for sheet, rod and wire of the respective grades. One page is devoted to weight tables. The Seymour Manufacturing Co.

☐ 15. SAFETY HEATERS — Bulletin HP 1650 describes Precision safety heaters designed for safety and easy handling in the job of heating complex glassware setups involving distillation columns, cumbersome flasks, delicate reflux condensers, and other costly glassware. Precision Scientific Co.

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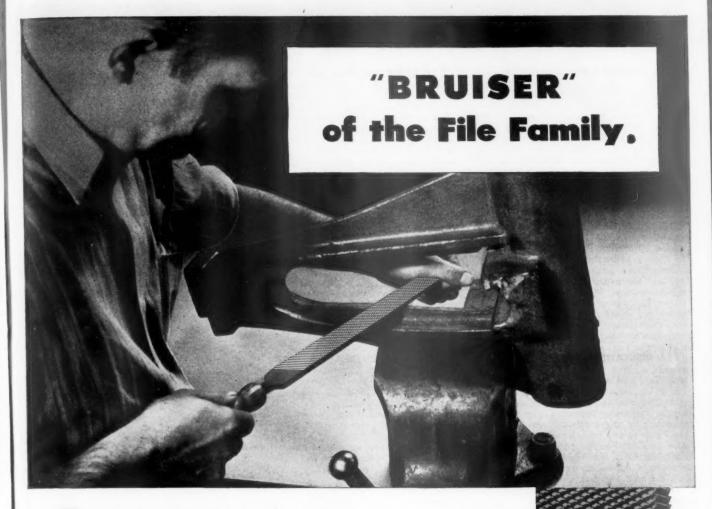
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THE Nicholson Special Purpose Foundry File is a "roughneck" because it has to deal with tough adversaries. Teeth are stocky and sturdy, with heavy-set edges to resist shelling and breaking out. Designed for rough filing beyond the service expected of regular files—like knocking off fins, sprues and other hard projections from rough castings. Or filing narrow edges and sharp corners of dies.

To the special features, add the over-all high Nicholson standards of steel specifications, accuracy in cutting, uniformity in hardening, and rigid inspection and testing... and it becomes understandable why the Nicholson guarantee of Twelve perfect files in every dozen is safely within the definition of the most exacting user.

Made in sizes from 8" to 14". Stamped "Foundry."

• Other Nicholson Special Purpose Files include files for: Aluminum, Stainless Steel, Brass, Lead, Die Castings, Die Making, Lathe Filing, plus milled curve-tooth files and a wide range of Swiss Pattern Precision Files. Consult your mill-supply house. Or WRITE FOR TECHNICAL BULLETINS.

FREE BOOK, "FILE FILOSOPHY"—an excellent illustrated 48-page "handbook" on kinds, use and care of files. Helpful to production and purchasing heads, foremen, master mechanics.

NICHOLSON FILE CO. • 28 ACORN STREET, PROVIDENCE 1, RHODE ISLAND
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FOR EVERY PURPOSE





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"Know-How" Information, Continued

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☐ 16. COLLETS & STOCK PUSHERS — A 20-page catalog, No. 45, illustrating and giving complete specifications for line of collets and stock pushers, including models of new design, has been released by the Sheffer Collet Co. One of the new units has a "cup point" lug in each serrated section that penetrates the stock slightly with the collet in the locked position. The Super-Grip collets are said to be particularly effective for handling hot-rolled steel, and was designed for holding stock sizes of 2" and larger. The Sheffer Collet Co.

☐ 17. PUMP HANDBOOK — "Self-Priming Centrifugal Pumps" is name of handbook issued by Marlow Pumps, which sets forth in easy to understand style the principles of centrifugal action, the physics of pumping and the evolution of self-priming centrifugal pumps. It tells the difference between the types of self-priming centrifugals, points out where self-primers can be used with best effect, and details how to install and care for them.

□ 18. INSULATING VARNISHES and Compounds — That is the title of 56-page informative booklet issued by the John C. Dolph Co., which contains many helpful tables, charts, and articles, all compiled for the purpose of providing a worthwhile approach to any insulating varnish problem. It is said to be a handy, ready reference for many problems such as the selection of insulating varnishes and compounds, thinning of varnishes, etc. Subject matter includes air drying varnishes, baking varnishes, machinery enamel, special lacquers, etc.

☐ 19. RG CABLES — Catalog Section "D" describing 26 different types of RG cables and companion HF connectors for U.H.F. and electronic applications, is available from American Phenolic Corp. The section brings up to date details and specifications governing the production of RG type cables as approved by the Army-Navy R. F. Cable Coordinating Committee.

☐ 20. FLUORESCENT LIGHTING — Eightpage catalog section, No. 11-44, giving dimensional data on the Wakefield Grenadier, photometric performance, and layout design helps, has been issued by F. W. Wakefield Brass Co.

☐ 21. TABLE TOP Chain Belts — Bulletin 464 issued by the Chain Belt Co. illustrates and describes Rex Table Top belts "whose acceptance in canning, bottling, packaging and conveying is based on proved facts." It is said to present the closest approach to a level, continuous moving table offered in a flat top chain belt today, and to practically end spillage and breakage due to pille-ups.

□ 22. COLOR POWER — Here's an interesting set of four brochures and α set of color swatches, available from the Ārco Co., describing simplified scientific color selection for industrial interiors. The titles of the brochures are "Optonic Color System", "Color Power for Industry", "Color for Safety" for industrial plants, and "Ā Standard Code for Identification of Piping Systems." The Optonic color system is said to permit persons without detailed technical understanding of color science to specify correct color shades that minimize fatigue and promote safety.

□ 23. PORTABLE INFRARED UNIT — Models of portable infrared heating units which may be used for various applications including baking, drying, preheating, etc., are described in Fostoria catalog. A 20 gauge black metal panel 1½" in diameter can be heated in excess of 800° F in 1½ minutes with any of the models. Units are said to be ideally suitable for numerous operations of production, maintenance and laboratory. Fostoria Pressed Steel Corp.

☐ 24. FLUXES — Catalog describing the complete line of "Superior" fluxes is announced by Superior Flux Co. Included in the line are 20 fluxes for welding, brazing, silver soldering, soft soldering and low temperature alloy welding of ferrous and non-ferrous metals and alloys.

☐ 25. MAINTENANCE WELDING — Sixpage folder on Low Temperature welding rods, concentrating on the problems which concern maintenance, has been issued by Eutectic Welding Alloys Co. Folder describes procedures fully, and contains many suggestions for salvaging damaged parts.

☐ 26. FLAMEPROOF WORK CLOTHES — Bulletin and swatch card describe Flame-Safe service for cleaning and fireproofing workers clothing of all kinds in one operation, and canvases, blankets and gloves. Universal Safety Equipment Co.

☐ 27. BRUSHES — "Know Your Brushes" is title of 115 page catalog designed for both the arts and the trade, with both alphabetical and numerical index. Catalog covers brushes for painters, artists, stencil and marking brushes, sign writers, glue paste and oil brushes, brooms, scrub, dairy and bakers, brushes, etc. Each brush is illustrated and all specifications are given. Solo-Horton Brush Co., Inc.

□ 28. MEEHANITE CASTINGS — If you buy castings you will find "Stories of Meehanite in Industry" (Bulletin No. 22) of practical value. It is a collection of articles about Meehanite castings appearing in various trade publications, published by the Meehanite Research Institute. Subjects include Properties, Design, Gears, Dies, Brake Drums, Crankshafts, Hardening and Heat Treatment, Marine Castings, Machinery and Milling Cutters, and Miscellaneous Castings.

☐ 29. CERAMIC INSULATION — Molding Bulletin 103, Mykroy Perfected Mica Ceramic Insulation, 12 pages, presents a discussion of the advantages and disadvantages of all types of insulation and states the case of Mykrog glass-bonded ceramic No. 51 in its application to injection molding. It shows variety of electronic parts being molded with and without metal inserts. Tables and charts give electrical, mechanical and physical properties. Electronic Mechanics, Inc.

☐ 30. HEATERS and COOLERS — Looseleaf, two color bulletin No. 35-76-B on Adsco Heaters and Coolers includes three new types with dimensions, capacity tables and list prices on units suitable for use as instantaneous heaters, condensate coolers, preheaters, fuel oil heaters, etc. American District Steam Co.

□ 31. ELECTRODE WALL CHART—Murex wall chart (24" x 36") is practical guide in selecting electrodes for individual welding jobs. It contains a list of Murex electrodes divided into four groups for quick reference, including (1) mild steel, (2) special steels, (3) stainless steels, and (4) hard surfacings. Electrodes are described according to AWS-ASTM class, with color identification, etc. Metal & Thermit Corporation.

describes newly developed Korfund Type SL Universal Vibro-Isolator which absorbs vibration in all directions. It is said to be effective vibration control for wide variety of applications, including punch presses, shears, hammers, grinders, shakers, Diesel engines, generators, business machines, etc. Six basic sizes, load capacity 200 to 12,000 lbs. Korfund Co.

☐ 33. PLYTUBE — Two bulletins describe this laminated tubing fabricated from thin wood veneers and a waterproof plastic resin. It is said to be stronger than steel tubing, weight for weight. It is treated to be protected against rot, corrosion, fungi,

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PROVIDE A BALANCED PRODUCTION LINE FOR FAIRCHILD CAMERAS

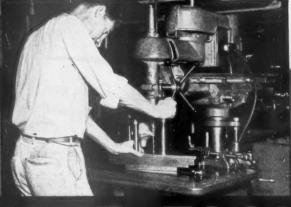


15" DRILL PRESS drilling and reaming holes for locating pins on Fairchild derial camera lens cone.
One of many Walker-Turner Drill Presses in this plant.

WALKER-TURNER RADIAL DRILL drilling foirchild Sound Recorder drive assembly. Easily maneuvered for drilling large castings. Tilling head eliminates need for angle vice and special sef-up in drilling angled holes.

At Fairchild Camera and Instrument Corporation, production lines require quick changes in operations. Drilling, tapping, reaming, and counter-boring of all sizes of aerial camera parts are some of the important jobs assigned to Walker-Turner Drill Presses. These rugged, simple tools are readily moved from one department to another, or within departments, as needed. Because of Walker-Turner flexibility, all operation changes can be made quickly — regardless of size of part. Thus a steady flow of urgently needed camera parts is maintained.

WALKER-TURNER CO., INC., PLAINFIELD, N. J.



walker Turner COMPANY, Inc. PLAINFIELD, N.J. U.S.O.

MACHINE TOOLS

DRILL PRESSES - HAND AND POWER FEED . RADIAL DRILLS
METAL-CUTTING BAND SAWS . POLISHING LATHES . FLEXIBLE SHAFT MACHINES
RADIAL CUT-OFF MACHINES FOR METAL . MOTORS . BELT & DISC SURFACERS

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"Know-How" Information, Continued

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splintering, termites and flame. Uses are many—antenna masts, furniture, poles, piping, ladders and towers, containers, handles, shafts, rollers, pulleys, conduit, beams, rafters, framing, Lally columns, etc. Lengths may be jointed by an internal or external sleeve. Plytube can be machined with standard woodworking equipment, and it can be fitted for use with metal or plastic fittings. Plymold Corp.

☐ 34. FLEXIBLE SHAFTING and Stow flexible shafting equipment are described in detail in 22-page catalog. Machines are for grinding, sanding, wire brushing, drilling, buffing, polishing, and filing. Portable, bench or truck, and suspended models are illustrated. Mounted wheels and mounted points are also illustrated, Stow Manufacturing Co.

☐ 35. RUST PREVENTIVE — Technical service data sheet, describes, Peroline No. 3, a rust preventive for use on iron or steel products while in storage of transit. It reacts chemically with the metal and removes blushes of rust, eradicates hand marks, counteracts the rusting action of soldering acid, when present, and minutely etches and darkens the surfaces. At the same time it develops a thin oil-like coating bonded securely to the metal. When used as slushing compound surface is so conditioned that improved paint adhesion and protection are obtained. American Chemical Paint Co.

☐ 36. FIRE EXTINGUISHING EQUIPMENT
—Bulletin describes Plus-Fifty Dugas Dry
Chemical, and Dugas extinguishers—hand
and wheeled, and accessories. Manufacturer states extinguishers do not require
periodic recharging. There are no toxic
fumes or gases. Extinguishers generate carbon dioxide and water vapor; are non
freezing; can be used safely on electrical
fires; and will not cake or harden. Ansul
Chemical Co.

☐ 37. RADIAL SAW—Bulletin describes Monarch Uni-Point radial saw featuring what is termed an entirely new wood cutting principle called "One Point Cutting" which means that the saw blade always enters the lumber at the same point in the table regardless of how set for vertical terms.

tical, horizontal, or compound miter cross cut angle. Once set, the blade is always correctly positioned. Angle changes can be made without stopping the saw. Gauges always remain fixed. American Saw Mill Machinery Co.

38. SUMP TANK CLEANING Machine—Bulletin describes Model 20-T sump tank cleaning machine which cleans sump tanks of all sludge, chips, oil and coolant on grinders, automatics, lathes etc. in less than 10 minutes, according to the manufacturer. Cleaner is said to cut cleaning time on grinders and other machine tools 75%. Unit is fully automatic, enabling one man to do the work of several. W. R. Carnes Co.

☐ 39. GAS & OIL BURNERS—Bulletin 902 describes Peabody Type M gas burners, and combined gas and oil burner, the latter being standard gas burner with an oil atomizer which is carried in the hub of the register. The burners are available in a full range of sizes (natural or forced draft) suitable for heating boilers, industrial furnaces, power boilers, oil refinery furnaces and for many special applications. Both the oil burners and the gas burners are convertible to gas or oil respectively. Peabody Engineering Corp.

☐ 40. CAPACITORS—New line of high-frequency, parallel-plate capacitors, designed for use in the resonant circuit or "tank circuit" of high frequency electronic oscillators such as those used in electronic-heater equipments, is described in Bulletin GEA 4365. When connected in parallel with an inductance coil this class HFP water-cooled capacitor constitutes the resonant circuit which determines the frequency of the oscillator. General Electric.

☐ 41. STEEL WEIGHT TABLES—Pocket booklet available from Kropp Forge Co. contains weight tables of: Round Corner Square Bars, Round Bars, Flat Steel, Hexagon and Octagon Bars; Decimal Equivalents, and Ratio of Specific Gravity of Metals compared to steel.

42. CHEMICALS—Handy pocket-size booklet containing list of chemicals made and sold by Hercules Powder Company's

Cellulose Products Department, types available, their end uses, and pertinent packing and shipping information is titled "Chemicals for Industry." It is designed as a useful aid to technical and non-technical persons interested in the use of these products in plastics, films, lacquers, adhesives, varnishes, chlorinated rubber, printing inks, and for the flameproofing, waterproofing and weatherproofing of textiles.

☐ 43. WATCHMAN'S SYSTEM — Eight page bulletin describes the Dudley Tour Key System, known as the Faraday-Dudley Watch Report System. Faraday Electric Corp.

☐ 44. DRILL RODS and Tool Steels—Carbon and high speed steel drill rods and cold drawn tool steels are described in new catalog of Allegheny Ludlum Steel Corp. Steels are furnished in three standard and five special grades. Information is given on lengths, sizes and weights, finishes, tolerances and hardness values.

☐ 45. COMPAR PRODUCTS—Compar is a synthetic resin which when compounded and processed, becomes a tough, strong, flexible, rubber-like material. Heat and cold use limits are minus 40°F to plus 275°F. Products include gas-proof, solvent-proof, hydraulic and vacuum hose and tubing, hose assemblies, sheet material, including gaskets, washers, and diaphragms, mechanical molded goods, gloves, aprons, paints and coating solutions. Industrial Catalog describes products in detail. Resistoflex Corp.

☐ 46. CLUTCHES—Two bulletins describe Hilliard Slip Clutch and Over-load Release clutch. They tell in concise, readable form what the operation of each individual clutch is designed to accomplish, and give pertinent information concerning the mechanical details of each of them, and discuss typical applications. The Hilliard Corp.

☐ 47: POSTAL RATES—Folder charts new postal rates and current postal regulations, giving tables of postal fees and rates for first class, second class, third class and parcel post material, air mail, and money order and insurance rates. Tension Envelope Co.

☐ 48. PLASTIC TUBING — Bulletin describes Tulox extruded plastics tubing, product of Extruded Plastics, Inc. Manufacturing processes produce seamless, practically strain-free tubing to micromatic tolerances. Tubings are manufactured from wide variety of resins, each with its characteristic advantages—and limitations, and can be designed to resist extreme cold, heat, chemical action or other influences. Tulox can be rigid or in varying degree of pliability; in color or colorless, transparent, translucent or opaque. Illustrations show end uses.

☐ 49. SHIPPING CONTAINERS — "Engineered Shipping Containers" is the name of ready reference file illustrating varied styles of boxes, crates and cases—all-bound, wirebound, cleated, nailed, fibreboard, wood and corrugated. General Box Co.

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Know-How" Information, Continued USE COUPON ON EACH PAGE

Two new bulletins, 306 and 306A, describing multiple punches and spacing tables have been issued by Thomas Machine Manufacturing Co. No. 306 carries 25 large illustrations, including tool set-ups for punching plates and shapes. Punches in 6 sizes from 105 tons to 1000 tons for punching plates and structural material are shown. No. 306A describes the mechanics of the spacing table acting with multiple punch, and discusses advantages over hand layout and punching.

☐ 51. ELECTRIC HOISTS — Bulletin describes P&H Handi-Lift electric chain hoist with 500-lb. capacity; Zip-Lift full electric wire rope hoist, capacities up to 2000 lbs.; Hevi-Lift electric hoist with capacities up to 15 tons, and Trav-Lift which is available in capacities up to 15 tons, single or double I-beam types, 1, 2, or 3 motors with floor or cage control. Harnischieger Corp.

52. COLD SETTING PHENOLIC GLUE—Cold-setting phenolic-resorcinal resin glue for wood bonding which provides maximum water resistance for exterior plywood applications, are described in detail in 8-page Technical Data booklet "Bakelite Cold-Setting Phenolic Resin Glue XC-17613." This glue was developed for the lamination of heavy lumber, beams, arches, and ship's timbers. It is also used for plywood glider fuselages, aircraft and marine constructions, and meets AAF Specification 14124. Bakelite Corp.

53. UREA RESIN GLUES—Bakelite Urea Resin Glues is title of 12-page illustrated booklet on these glues for plywood and densified wood. Purposes for which they are best suited are discussed. Case histories of uses are given. Bakelite Corp.

54. WELDERS' CLOTHING—New book-let listing and describing safety clothing for male welders—overalls, all-leather pants, hot weather pants, chaps, aprons, coats, cape sleeves and bid, short jacket sleeves, gloves, spats, etc., is available from American Optical Co.

55. COUNTING MACHINES—Counting machines to automatically keep track of output of automatic machines, eliminates disputes, delays and inaccuracies, and to keep all sections of a production line synchronized are described in booklet published by F. B. Redington Co. Illustrations show varied installations on sealing machines, drill presses, punch presses, grinders, etc, etc.

☐ 56. TAPPING MACHINE—Bulletin tells about the Prutton 3-spindle automatic tapping machine known as the Tapmaster. It is composed of three independent units any one of which can tap any size thread up to 1". One, two, or three sizes of work can be handled at the same time. Machine has 3 motors with separate controls. D. H. Prutton Machinery & Tool Co.

57. AIRCRAFT WIRE—"Rockbestos" is the name of a wide line of electrical wires, cables and cords for use under severe or unusual service or operating conditions. Bulletin 53-A describes the construction and characteristics of this light-weight, small diameter, flame resistant aircraft circuit wire, cables and cords, with asbestos insulation. Rockbestos Products Corp.

700 describes Gould Kathanode Glassklad 58. BATTERIES for DIESELS—Catalog Batteries for Diesel Locomotive Service. They are claimed to provide exceptionally high starting performance, durability, and long life, and to be ideally suited to withstand the constant charge encountered in diesel service. Gould Storage Battery

59. CORROSION—This is title of 54page publication issued by the International Nickel Co., which is described as a convenient and comprehensive corrosion principles for both the practical man and the technician in the metal field. It explains corrosion processes and the factors that influence their action. Tables list 500 typical corrosives in which Monel. nickel and Inconel have been used success-

☐ 60. SPRING LOCK WASHERS—Spring Lock Washer Folder 142 covers engineering data on all types of spring lock washers, and contains compact general information and ready reference on steel section size, and I. D. and O. D. dimensions, for purchasing, engineering and designing of Reliance Spring Lock Washers. Eaton Manufacturing Co., Reliance Spring Washer Div.

☐ 61. LIGHTING — Bestran Ballasts for Fluorescent Units is title of catalog just released by Hudson American Corporation. Models are illustrated, and construction, operating and other factors described. Power factor correction is placed at 95% plus, hum is said to be eliminated, and stroboscopic effect reduced to minimum.

☐ 62. GLASS TANKS—Bulletin describes Glass Tanks for hot acids, electroplating, dyes, foods and other "hard to handle" solutions. Tanks are manufactured from heavy plates of specially heat-treated glass, in two general types. The Herculite treatment makes glass approximately 4 times as strong as regular glass of the same thickness and permits it to withstand instantaneous temperature shock of approximately 400 deg. F., and continuous working temperatures from 500 to 600 deg. F. Pittsburgh Plate Glass Co.

☐ 63. PROTECTED MOTOR — Protected-Type motor designed for both drip-proof and open motor applications, is illustrated in 4-page bulletin. Motors are rated on same basis as conventional open types-40 C rise, full-load continuous duty, with a 15% service factor. Principal applications are pointed out in the text and illustrations. Crocker-Wheeler Divn. of Joshua Hendy Iron Works..

64. AIR HEATER—Recirculating Indirect Air Heater with claimed fuel efficiency of 85% and over is described in bulletin issued by J. O. Ross Engineering Corp. The unit functions at top efficiency with either oil or gas. Two sizes are built, R-75-750,000 BTU per hour output, and R-100-1,000,000 BTU per hour output. Maximum air delivery temperature is 600 deg. F.

65. POLISHING WHEELS—Circular announces Norflex Polishing Wheels for speeding up de-burring, finishing and polishing operations. They are available in three types to meet varying conditions. Common to all types is the flexible type of bond which supports and holds abrasive particles in place. Types are Resilient Rubber, Fiber Resinoid, and Cork Resinoid. Norton Co.

☐ 66. BLACK & WHITE PRINTS—Booklet of 28 pages describes BW equipment for making black and white prints, printers and developers and printer-developers. Condensed specifications are given for the various types of equipment. Charles Bruning Co.

☐ 67. ROTARY SHEARS—Bulletin QW-120 issued by the Quickwork Divn. of Whiting Corp., features the application and operation of attachments used on rotary shears. It gives a clear understanding of the wide range of work that can be handled effectively by these attachments. Circle cutting, slitting, joggling, and flanging attachments are featured.

☐ 68. STEEL BAR GUIDE—Bulletin No. 4, a 20-page steel bar planning guide for Use in Selecting Proper Cold Finished and Furnace Treated Bar Steels, has been issued by the La Salle Steel Co. It gives information on fast machining steels, carburizing, induction hardening, N. E. Steels and other subjects you may find of practical interest.

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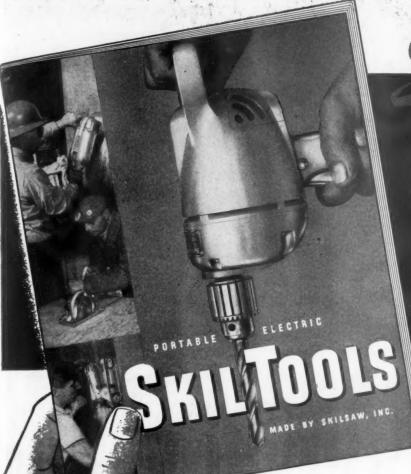
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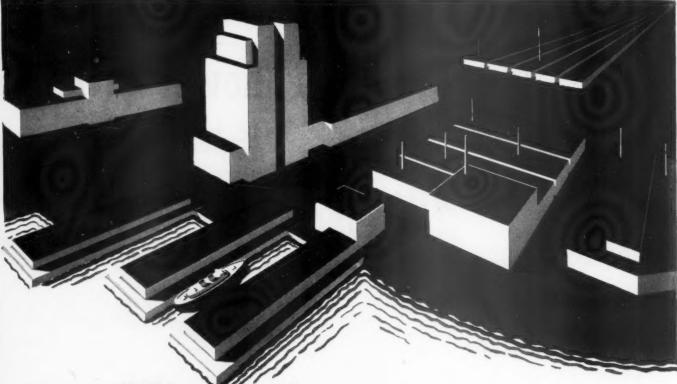
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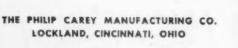
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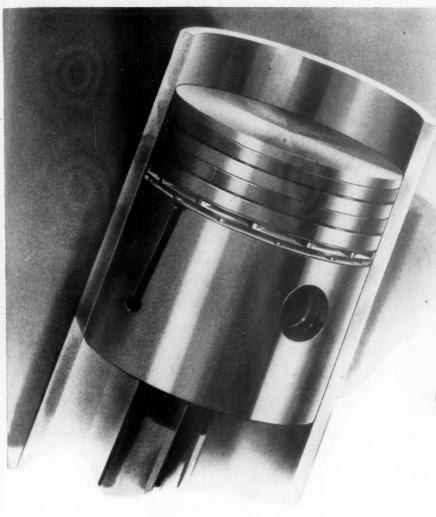
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Wagner squirrel-cage rotors are cast under heavy pressure. The aluminum completely fills the rotor slots and tightly clamps the punchings.

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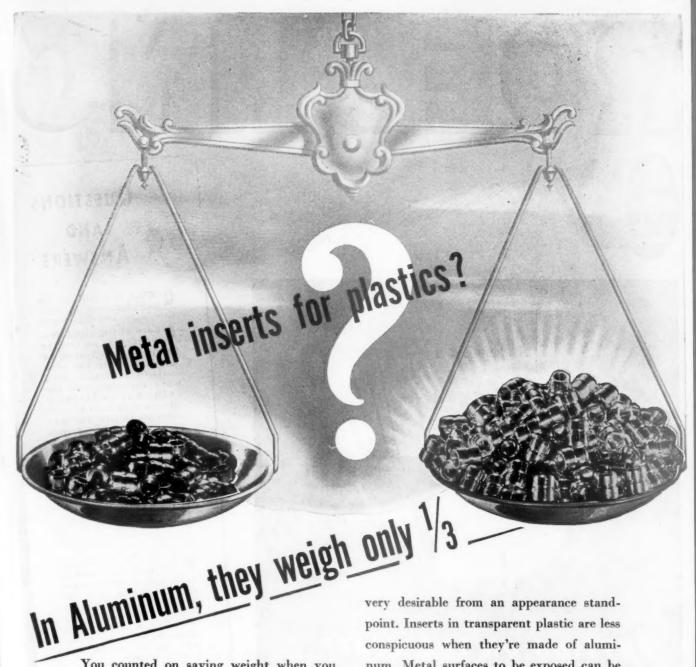
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QUESTIONS AND Answers



Q What is meant by the designations of 6x7, 6x19, 8x19, and 6x37 rope? A Each of the above designates a particular group or classification of wire rope: the 6x7 rope contains 6 strands of 7 wires each, whereas the 6x19 rope contains 6 strands with from 16 to 25 wires per strand. The 8x19 rope contains 8 strands with from 16 to 25 wires per strand, while the 6x37 rope contains 6 strands having from 26 to 46 wires per strand.

Q How do the above groups or classifications of ropes compare as to abrasion resistance and flexibility?

A The 6x7, 6x19, 8x19 and 6x37 ropes are rated as listed with respect to abrasion resistance, the 6x7 having the greatest resistance to abrasion. The flexibility of these ropes follow in the same order with the 6x7 having the least flexibility.

CHOOSE WIRE ROPE FOR THE LONG PULL!

HOT LADLE CRANE OR SPECIAL PURPOSE HOIST—efficiency depends on wire rope that has the capacity to deliver... day in and day out. That's why, when the heat's on to meet production schedules, you can have confidence in Roebling "Blue Center" Wire Rope. Its all-around, built-in quality makes it ideal for handling tough mill and factory jobs.

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Engineered Control of Vibration To Improve Any Moving Product



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Silentbloc is not a "piece of rubber" stuck in because it is resilient. These shear-type mountings, bearings and couplings are engineered in shape, size and design to give the exact performance that solves your particular problem.

In its various forms, Silentbloc can do three things:

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- 2. Give trouble-free torque action.

3. Correct for misalignment in bearings or shafts.

The predictable operation of Silentbloc comes from its patented principle of elongation and confinement of the rubber.



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After Assembly

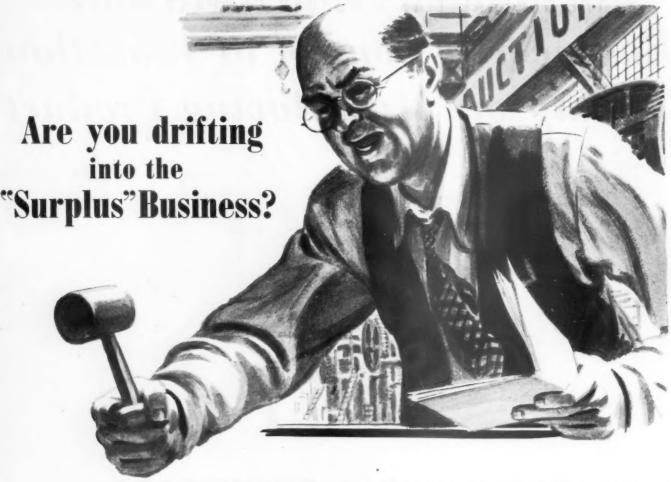
Our skilled engineers can fit Silentbloc to your job by varying its size and design, the elongation, the distortion of inner and outer diameter of the rubber, the type and modulus of the rubber. The stretched rubber stays alive even when not in motion,

Silentbloc has proved its advantages in many fields—war material, automobiles, aircraft, industrial and home machinery, electrical and electronic equipment. It can improve your product. For fuller information, write The General Tire & Rubber Company, Dept. 201, Wabash, Indiana.

THE GENERAL TIRE & RUBBER CO.

Mechanical Goods Division, Wabash, Indiana





It has been estimated that \$20 billions of surplus material will require disposal at the war's end. How will your postwar time and energy be spent — in production, or in the "surplus" business?

As far as steel is concerned, you can trim inventories right now—by buying as you go from a Frasse warehouse. Frasse stocks of cold finished bars, tubing, stainless, alloy and aircraft steels are ample. Tonnage has more than doubled to

echanical and Aircraft Steels

serve war needs. By using Frasse stocks, you maintain war production, but keep your inventory low — escape dead surplus when cancellations and cutbacks occur

No need to pile up your "surplus problem" with Frasse steels handy . . . mechanical and aircraft grades in extensive size and shape ranges are readily available. To keep up production . . . keep down the surplus risk . . . call Frasse first.

PETER A. FRASSE & CO., INC. 17 Grand St., New York 13, N.Y. (Walker 5-2200) • 3911 Wissahickon Ave., Philadelphia 29, Pa. (Radcliff 7100-Park 5541) • P. O. Box 946, Buffalo 5, N.Y. (Washington 2000) • Jersey City 2, N. J. • Hartford 5, Conn. Rochester 4, N.Y. • Syracuse 2, N.Y. • Baltimore 2, Md.

AIRCRAFT ALLOY BARS AND TUBING • COLD FINISHED CARBON BARS, SHEETS AND STRIP

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STAINLESS STEEL SHEETS, STRIP, PLATES, BARS, WIRE, PIPE AND TUBING

SEAMLESS CARBON AND ALLOY TUBING • POLISHED DRILL ROD

HOT ROLLED AND COLD DRAWN SAE, AISI AND NE ALLOY BARS

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IT IS EASY to see that both these gentlemen are satisfied customers of General Industries. One acclaims our "know-how" in molded plastic parts—the other our velvety Smooth Power motors. Yes, we do both jobs under one roof and one management.

GENTLEMEN, YOU'RE BOTH RIGHT!

The plastic parts buyer has profited from the ingenious skill of our mold makers, who enable us to turn out tricky jobs economically and on time. Quite likely he has seen our up-to-date equipment for compression, transfer and injection molding of large or small parts in any quantities. Our engineers have made sensible and workable suggestions, by reading between his blueprint lines. He is typical of leading manufacturers in many fields who rely upon General Industries plastics division.

The speaker on Smooth Power motors might be a radio-phonograph builder who uses our turntables, record changers and recorders. Or he might be a designer who depends upon these fine low-torque drives to power electric, electronic or mechanical devices. In any case, he's well acquainted with the facilities of our Smooth Power motor division.

We want to emphasize the point that we're a thoroughly able producer of both these products. If your plans call for either or both, we'd like to work with you. In your request for details, please address the respective division . . . small motors or plastics.





How Rutland Profits with Bowser EXACT Liquid Control



When a single type of equipment serves a manufacturer in many different ways, that's a definite plus.

Take, for instance, the Bowser Meters in the plant of the Rutland Fire Clay Company, Rutland, Vermont, nationally known makers of heat resisting specialties. First, Bowser Meters measure incoming solvent—an obviously important check-up. Then, they measure—right down to the exact spoonful—the liquids going into Rutland products.

And in both operations, Bowser Meters paid off handsomely in these ways:

Uniformity of Product—Human error is eliminated.

Money-saving—A Bowser Meter on the intake line stopped discrepancies and resulting losses.

Time and Labor Saving—An operator sets the Bowser Predetermining Meter for the amount needed for a mix... then goes about other work. Time and labor is saved! Production steps up!

Your operation may be entirely different from that of the Rutland Company, but somewhere in your plant there is a job that can be done better, quicker and more economically by a Bowser Meter, Filter, Proportioner, Lubricating System, Oil Conditioner, Pump or other Bowser unit. Write for complete information about how Bowser equipment can give you important savings and service. Address: BOWSER, INC., Dept. 22-D, Fort Wayne 2, Indiana.



Not only has Bowser's war production earned the Army-Navy E... Bowser equipment has helped earn it for-scores of other companies.



THE NAME THAT MEANS

EXACT CONTROL OF LIQUIDS



Round-the-Clock Carloading at Inland

Carloading and prompt dispatch of cars from the mill are important to Inland because they are important to Inland's customers. These round-the-clock jobs have been intensively studied, resulting in improved packaging and carloading despite full rolling schedules, shortage of some types of railroad equipment, scarcity of bracing, etc.

Before an order is to be processed by Inland, cars of suitable types are ordered into the mill. Cars to be loaded with the product of one mill are spotted at that mill. When carloads are composed of products from two or more mills, loading is speeded by spotting a car at one mill and trucking

the products of other mills to the car. Throughout each hour of the twenty-four, expediters keep steel flowing to loading points and as soon as cars are loaded, they are switched to the railroad yard where they are assembled for quick dispatch to our customers.

We invite you to confer with an Inland shipping specialist. He will gladly study your loading, unloading, and shipping problems, giving you all available assistance under the conditions of war, and helping you plan for speedier and more convenient delivery of steel for use in time of peace.



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Bars • Floor Plate • Piling • Plates • Rail • Reinforcing Bars • Sheets • Strip Structurals • Tin Plate • Track Accessories

INLAND STEEL COMPANY

38 S. Dearborn St., Chicago 3, Illinois

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SEALING ADVANTAGES

found in no other gasket material

BECAUSE they combine—in one material—the desirable sealing qualities of both cork and synthetic rubber, Armstrong's Corkand-Synthetic Rubber Compositions succeed in hundreds of applications where other gasket materials fail. Cork, for example, provides compressibility, while synthetic rubber assures imperviousness to specific liquids and gases as well as good tensile strength.

By using different sizes of cork granules and various types of synthetic rubber, Armstrong produces a broad range of useful combinations of these two materials. In each composition, compressibility, lateral flow, and other characteristics are controlled to meet specific applications exactly.

For specification data on these Armstrong Cork-and-Synthetic Rubber Compositions, write for your free copy of the new booklet, "Gaskets, Packings, and Seals." Armstrong Cork Company, Gaskets and Packings Department, 7204 Arch Street, Lancaster, Pennsylvania.

CORK-AND-SYNTHETIC RUBBER GASKETS



ARMSTRONG'S INDUSTRIAL PRODUCTS: CASKETS, PACK-INGS, SEALS, and MECHANICAL SPECIALTIES of Cork, Synthetic Rubber Compositions, Cork-and-Natural Rubber Compositions, Fiber-Type Materials, and Rag Felt Papers • RESILIENT SUR-FACINGS for desks, bars, counters, etc. • FLOORINGS for buses, railway cars, etc. • TEXTILE MILL SUPPLIES • SHOE MATERIALS • ADHESIVES • GLASS INSULATORS

ARMSTRONG'S
GASKETS • PACKINGS
AND SEALS

Just GOOD CLEAN FUN.

for Goats!



But it's no fun for management and production men in "no-count" plants. For without a continuous count of turns, strokes, operations, pieces, or other units of machine-performance, there's no sure way of telling whether you're up to schedule or behind it. And that leads head-on into a brick wall of doubt and uncertainty... which pays off in the lumps and bruises of miscounts, delays, errors, shortages or surpluses. But how to get an accurate, continuous count? Simply equip each production machine with a Veeder-Root

Counting Device, either mechanically or electrically operated according to need... and you will know where production stands on every machine, every moment. Then you can immediately detect and correct any slowdown or other mechanical difficulty as soon as it begins to develop. This is the modern system of Veeder-Root Countrol... which can be applied to cover all your war-production operations... quickly, inexpensively, and without interrupting plant routine.



VEEDER-ROOT INCORPORATED

Hartford 2, Connecticut

In Canada: Veeder-Root of Canada, Ltd., Montreal In England: Veeder-Root Ltd. (New address on request)



APRI



Pesco's Pumis Problem ... PRECISION BUILT SIRVENE

Pioneers in the science of compounding custom-built elastomers, Chicago Rawhide chemical engineers can fill performance specifications previously considered impossible. For example, check this typical case history of a problem solved by a special Sirvene formula: THE PRODUCT: A diaphragm for the improved Pesco fuel pump which now feeds America's leading fighting planes. THE REQUIREMENTS: Maintain dimensional stability and resilience in contact with oil and gasoline, remain flexible in extreme heat and cold, give full suction in emergencies, minimize time lost for replacement. THE RESULT: For several years now, a Sirvene diaphragm has delivered precision performance with endurance four

SINCE 1878

... The Chicago Rawhide Manufacturing Co. has specialized in the manufacture of Sirvis leather products for mechanical application. In 1929, Chicago Rawhide chemical engineers began a program of research, study and experimentation to develop elastomers which would operate efficiently under exceptional conditions. Sirvene was the result, and commercial production was begun in 1935. Sirvene was then, and has continued to be, the leader in its specialized field.

times as long as previous products.

Why does Sirvene produce such exceptional results? Because Chicago Rawhide engineers have an unparalleled backlog of research and practical experience, because oilresistant elastomers only are used, because a special Sirvene formula is developed to meet each problem, because production is under constant and rigid laboratory control. When you need a pliable part to operate under exceptional service conditions, investigate the advantages of Sirvene.

STRVENE

THE SCIENTIFIC COMPOUNDED ELASTOMER A Product of the Synthetic Rubber Division

CHICAGO RAWHIDE MANUFACTURING CO.

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Yale Electric Industrial Trucks save time and effort—are power-packed to speed the movement of tremendous tonnage per day—travel fast and maneuver easily in congested areas. High lift models save storage space.



cut handling costs.

STREAMLINED COUNTING speeds modern PRODUCTION...

Breeders of hidden costs in many plants are hit-or-miss sampling and hand-counting methods. Lost time, wasted effort and costly inaccuracy are the inevitable result. So wipe out unnecessary handling—match your production efficiency with counting efficiency: use Yale-made Kron Counting Scales!

In modern industrial weighing and counting practices, Kron Springless Dial Scales assure top efficiency. Precision-engineered to typical Yale standards, they are easy to operate—accurately weigh, count, measure and batch with maximum speed.

Investigate fully the many advantages offered by ruggedly-built, long-life Kron Scales. Ask also about other time and labor-saving Yale Materials Handling Machinery that helps cut production costs. Write to The Yale & Towne Manufacturing Company, 4530 Tacony Street, Philadelphia 24, Pa.



HOISTS-HAND AND ELECTRIC . TRUCKS-HAND LIFT AND ELECTRIC . KRON INDUSTRIAL SCALES



Call this pooch unusual? He's nothing compared with Continental's Plastics Division.

Today, when selecting the right plastic means so much to a product, our designers, engineers and research men have produced many unusual things. Plastic parts for swivels and syringes, cogs and combs and cutlery, plane parts and pumps—these and a lot more, planned and turned out by men who know their business.

Our long years of experience in the plastics field plus the best facilities you'll find anywhere add up to the solution to any manufacturer's problem of improving an old product or introducing a new one.

So count on Continental to suggest the exact plastic features your product should have. You'll find an alert, progressive organization ready to give sound, practical advice and assistance at all times.

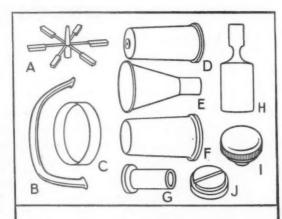
Tune in "REPORT TO THE NATION," every Saturday over CBS coast-to-coast network

PLASTICS

CAN COMPANY, INC.

HEADQUARTERS: Cambridge, Ohio Sales Representatives in all Principal Cities

COMPRESSION - INJECTION - EXTRUSION SHEET FORMING - LAMINATION



(a) Drawer pulls—injection; (b) Air scoop mounting—compression; (c) Globe base—injection; (d) Sales ticket-holder—compression; (e) Funnet—compression; (f) Shell for vaporizer—compression; (g) Bushing—compression; (h) Hairbrush handle—injection; (i) Gearshift ball—compression; (j) Brush cap for motor—compression.

Other products of Continental Can Company: Metal cans for food and other products; fiber and paper containers; crown caps and cork products; machinery and equipment. Special war cans and weapons.



Try these tougher wire wheel brushes from "Electric Tool Headquarters"

6 Wheel Sizes 3 Thicknesses

3 Gauges of Wire

Whirlwind Wire Wheel Brushes . . . made by Black & Decker on special Black & Decker machines . . . have proved on industry's production lines that they are definitely better, tougher, stand up longer . . . on all high-speed operations.

That's because crimped wire gives Whirlwind Brushes extra life and spring . . . assures correct clearance between wires ... holds the brush in an even, compact mass. And each separate tuft of wire is securely locked in a ring of steel! Whirlwind Brushes now are available in six sizes, three thicknesses and three gauges of wire . . . for use on almost any grinding, buffing or polishing machine and on all Black & Decker Portable Grinders, Bench Grinders and Sanders.

Order Whirlwind Brushes now . . . and get a demonstration of the extra durability and satisfaction that are engineered into every product of "Electric Tool Headquarters." There's a Black & Decker Distributor near you, as a ready source of supply. The Black & Decker Mfg. Co., 664 Penna. Ave., Towson 4, Md.







PORTABLE GRINDERS

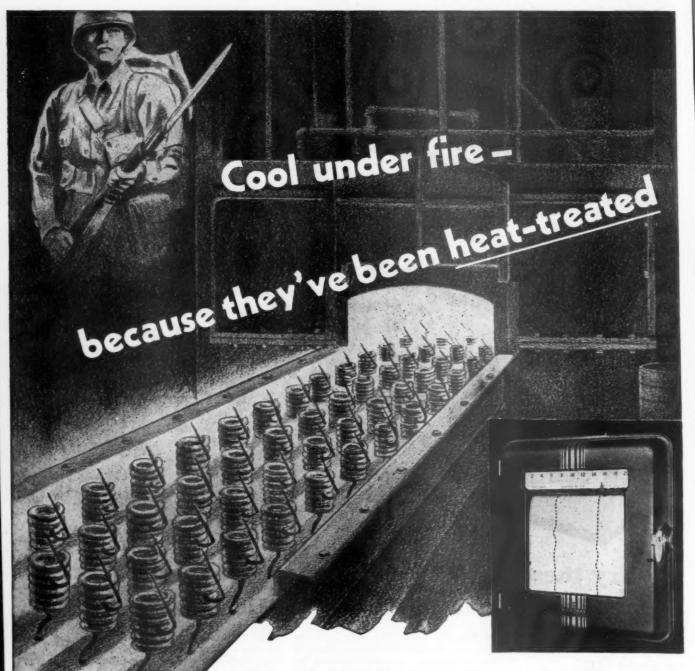


VALVE REFACERS ELECTRIC DRILLS





APRI



The best trained troops require tempering under fire to become seasoned fighters. Springs, too, need proper tempering to fit them for the rigorous demands of tough fighting mechanisms. Because heat-treatment is so vital to spring performance, its selection and control come within the realm of our laboratory technicians, with automatic regulation that insures parade-ground precision—precise action—long service. No guesswork—Barnes-made Springs are under strict discipline in every stage of manufacture. They obey your orders.

CONSERVE METAL - DESIGN WISELY



Barnes-made Springs

WALLACE BARNES COMPANY DIVISION OF ASSOCIATED SPRING CORPORATION BRISTOL, CONNECTICUT. U. S. A.



Before too long, the boys should be coming home. And that means Tom, too-the fellow who used to work for your *Industrial Supply Distributor. You remember him very well as the man who helped you that time you needed something special or something in a hurry and he came through for you by virtue of his digging up some source that was able to supply you.

Tom has learned much in the service that

will benefit you. He has learned new technical skills, new ideas. His war-born experiences are sure to help you. So look for him when he returns . . . and you are sure to enjoy renewing that old acquaintance.

Remember the service your *Industrial Supply Distributor has given you, and . . .

Telephone your * S SUPLY DISTURBUTOR FIRST!











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with MEYERCORD **DECALS**



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Score a **BULLS**·**EYE** in Low-cost, LASTING IDENTIFICATION

Your postwar product deserves a fine trademark...a lasting form of identification that continuously tells "who made it" for the life of the product. Meyercord Decals, combat-tested on world battle fronts, provide the ideal trademark or nameplate. They're durable, washable, and resistant to acid, vibration and temperature extremes. They can be produced in any size, colors or design and applied at fast production line speeds. No rivets, bolts or screws required. Easy-to-use methods of adhesion permit fast, lasting application to any known commercial surface. Investigate the better "Trademarksmanship" of Meyercord Decals. Free designing and technical service is at your disposal. Write for literature. Address all inquiries to Department 61-4

Buy War Bonds and Keep Them

DECORATE EYERCORD

World's Largest Decalcomania Manufacturers

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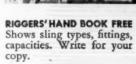


A lot of industries have taken a fresh hold on the sling question as a result of war production. And what a grip they get by using the adaptable Yellow Strand Braided Safety Sling! After handling just about every extreme in lifts — from multi-ton ship sections, tanks and guns to light-weight parts, jigs and crates—this improved type of sling is today primed to speed your assembly line, shop or field operations.

Tough Yellow Strand Wire Rope provides the sling's strength. The patented braiding adds flexibility, kink-resistance and a snug grasp on odd-shaped, rounded or slippery objects. The combined result is a time-and-labor-saving sling with less weight and bulk than chain of like capacity... with limberness well suited to former Manila rope jobs... with security that safeguards both employees and loads.

Properly fitted, Yellow Strand Braided Slings will give long-lived, economical service. Send details of your application now and let B&B engineers offer a recommendation. Broderick & Bascom Rope Co., St. Louis 15, Mo. Branches: New York, Chicago, Houston, Portland, Seattle. Factories: St. Louis, Seattle, Peoria.





PPATENTS: U.S., 1478000, 1224671, 2142641, 2142642, 2299568; CANADIAN, 252874, 258068



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DELTA ROTARY FILES



IN HAND FILING DELTA FILES CUT COSTS



Because Delta is precision made. Each tooth is designed to do its full share of work. That's why Delta removes more metal with every stroke.

Delta Files do 25% more work on the average in the same time with the same effort. It's a fact established by actual scientific tests.

That's why faster working, longerlasting Delta Files cut your costs. in action

Speed and performance on filing jobs—that's the record being set by Delta Rotary Files.

For burring, for filing, for grinding, for smoothing—Delta Rotary Files increase production-per-man, cut hours to minutes.

Hard to use? Not a bit. Your newest workers can get the knack of handling the Delta Rotary File in a few days. Not only men, but the women too.

Delta Rotary Files come in every shape and size. There's one for your purpose, one that will save you money and speed your work.

> DELTA FILES

> > 1

DELTA FILE WORKS, PHILADELPHIA 37, PENNA.

CUTTING NEW HIGH-SPEED FIGURES



STAR-MO M-2

Improved

TUNGSTEN-"MOLY" HIGH-SPEED STEEL

Firth-Sterling's Star-Mo M-2 displays all the advantages looked for in a modern high-speed steel for general use.

It out-classes the old traditional 18-4-1 steels in all important points: it out-cuts and out-lasts, assuring bigger, more consistent production; it performs with ease. All this at a lower cost.

No wonder Star-Mo M-2 wins the acclaim of an ever-growing list of tool makers and automotive manufacturers. They know a head-liner when they see one perform. Your shop will be convinced too with a Star-Mo M-2 workout.

Firth-Sterling



Better
outcuts and outlasts 18-4-1

approximately 20% less

Easy to Handle ask our representative



The best "soft" hammers and mallets are rawhide—tough, resilient, long-lasting C/R mechanical rawhide. They strike effective blows without battering or marring... without fatiguing re-coil. They hold their true striking surfaces. Sizes and weights for every need. Hammers are malleable iron with replaceable C/R Rawhide insert faces.

Write for Catalog Sheets.

THEAD Rawhide MFC.CO.
1294 ELSTON AVE. * CHICAGO. ILLINOIS.

filosofy of bruying

ELBERT Hubbard please take notice. That famous definition of the Purchasing Agent, which described him as having ice water flowing through his veins in place of good red blood, is finally refuted by incontrovertible evidence, supported by an official document which not only proves the point at issue, but places the P.A. at the very head of the list, above all of his traditional detractors. For at the February 19th meeting of the Oregon Purchasing Agents Association, President Gordon Hanson accepted a citation and framed honor emblem from the American Red Cross for the distinction of being the first trade organization in the entire State of Oregon (other than individual business firms) to qualify for this emblem, representing blood donations by more than 75% of its eligible membership. The PAs went over the top rather handsomely, for 80% of the eligible members appeared at the blood bank, singly and in groups, and made their plasma contributions during the month starting January 17th. R. P. Stockwell was chairman of the committee in charge of arrangements for the Association's participation in this worthy cause. Dale Cowen of the blood center, in making the formal announcement stated: "The fact that members of the Purchasing Agents Association of Oregon, representing many business establishments both in and outside Portland. responded so promptly to their group's call to the blood bank testifies that an unusual effort was made." Paste that alongside Mr. Hubbard's definition, for it is evidence not only of good red blood but also of good warm American hearts. Sales managers' associations please copy—not this notice, but the deed.

S TILL fishing for the best way of handling surplus disposal, the Treasury Department's New York Office of Surplus Property held its first advertised "Fish Bowl" sale on February 28th, with bids opened and awards made in full public view.

The Treasury recouped \$25,209.02 by the sale of 16 lots of merchandise: one lot was withdrawn because of inadequate bids, and one lot of pumps and parts attracted no bids. Most spirited competition developed for 15,264 yards of elastic webbing, with 13 offers at or above the ceiling price of 6c per yard. Ceiling price policies being less elastic than the material, the time-honored governmental purchasing system was put into reverse and the lucky buyer chosen by lot. Most dramatic episode: even as bids were being opened on 17,986 mattress covers, a telegram from Washington halted the transaction and the mattress covers were withdrawn for shipment on Lend-Lease.

ONVENTION plans in many fields have been cancelled as a result of ODT's wartime-meeting First casualty among the local group meetings of N.A.P.A. is reported by the Purchasing Agents Association of Connecticut, whose membership and normal meeting attendance is on a statewide basis, technically in violation of the edict. For the time being, this organization is planning to carry on its activities by means of local groups in such industrial centers as Hartford, Waterbury, Bridgeport and New Haven, until conditions are such that the regular full Association meetings can again be scheduled.

RETURNING from one of our recent excursions on Purchasing business, we stood on the station platform in Wilmington, Delaware, waiting for the Penn Railroad's "Senator" to pull in from Washington, and were intrigued by a particularly handsome set of matched luggage, each piece neatly stamped in gold: "F.O.B. Wilmington."

THE government is apparently determined to keep its purchasing on a high ethical plane. We

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note that WFA has announced to cotton farmers that they are not required to pay CCC Purchasing Agents any fee for the preparation of sales documents used in connection with the current cotton purchase program. And so another potential racket is nipped in the bud.

PROPERTY disposal officers are not the only ones who have troubles in respect to surplus goods. Witness the State Purchasing Agent of Nebraska, presumably on the preferred list for getting an early chance at desirable surplus items, who had to have a special act of his legislature authorizing him to buy U. S. surplus commodities without first advertising for bids.

PERHAPS it was some similar technicality trouble that induced County Purchasing Agent J. W. Hughes, of Los Angeles, to contract for 2,610,000 aspirin tablets the other day. MRO, no doubt.

THE Baltimore Sun recently published an editorial on foreign trade after the war, based on the report of James M. Landis on his return from the assignment as ranking American member of the Middle East Supply Commission. Mr. Landis and the editor agree on the "cheerful naivete" of diplomatic missions that are "only salesmen for American goods . . . don't get down to the guts of the question of how these people are going to be able to buy any of our goods." The real problem, as stated in the editorial title, is this:

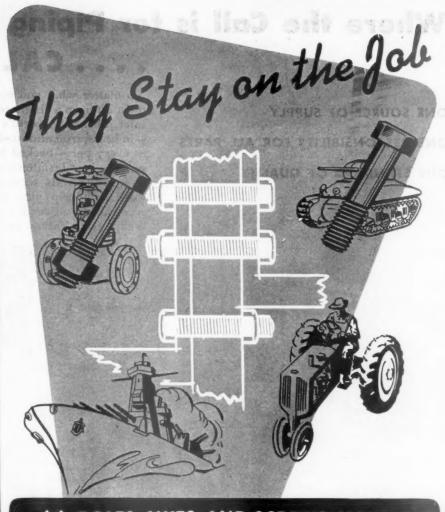
We Need Purchasing Agents As Well As Salesmen

The concluding paragraphs sum up the situation as follows:

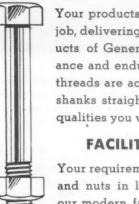
"Eventually America must confront this stubborn and unavoidable fact. Foreign trade is a two-way matter. To export, we must import. To sell, we must buy.

"As things stand at present, most Americans — farmers, organized labor and business men—are united in their agreement that exports after the war must be expanded. But by and large, their thinking stops at that point. With some exceptions, they are equally united on the thesis that the American market must be preserved for Americans.

"They can't have it both ways."



with BOLTS, NUTS AND SCREWS MADE BY GENERAL SCREW MANUFACTURING CO.



Your products are built for performance, to stay on the job, delivering the goods, day in and day out. The products of General Screw are also built to assure performance and endurance. Raw material is carefully selected; threads are accurate, slots true-centered, heads uniform, shanks straight. All the strong, lasting, quick assembly qualities you want are built into General Screw products.

FACILITIES FOR PRODUCTION RUNS

Your requirements for bolts, cap screws, machine screws and nuts in large quantities can be furnished through our modern facilities for long production runs. You will find it well worth while to investigate our productive capacity to supply your quantity needs. Write today.

ENERAL SCREW

Manufacturing Company

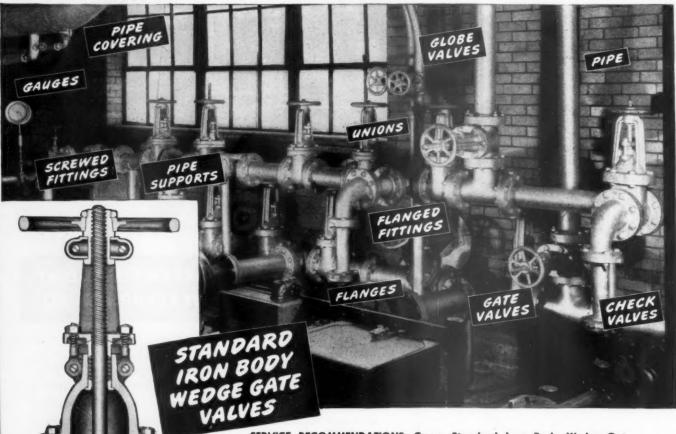
1238 W. Monroe Street, Chicago 7, Ill., U.S.A.

Where the Call is for Piping MaterialsCALL ON CRANE

ONE SOURCE OF SUPPLY
ONE RESPONSIBILITY FOR ALL PARTS
ONE STANDARD OF QUALITY

No matter what you need in piping materials, you can get them all from a single source—your Crane Branch or Wholesaler. There, the world's greatest selection of piping materials—in brass, iron and steel—is at your service. Uniform quality in every part—backed by a single responsibility—helps assure the best installation. Take advantage of Crane complete piping materials service to speed up deferred replacement work and keep pipe lines at peak efficiency. Crane has everything you need; for example, in Standard Iron Body Wedge Gate Valves, as shown below.

Piping book-up for a battery of pumps



SERVICE RECOMMENDATIONS: Crone Standard Iron Body Wedge Gate Valves with Brass trim are recommended for steam, water or oil lines; all-iron valves for oil, gas or fluids that corrode brass but not iron. Made in O. S. & Y. and Non-Rising Stem patterns.

Working Pressures

	Screwed o	or Flanged Valves	Hub End Valves
Size of Valve	Saturated Steam	Cold Water, Oil, or Gas, Non-Shock	Cold Water or Gas Non-Shock
2 to 12 in.	125 pounds	200 pounds	200 pounds
14 and 16 in.	125 pounds	150 pounds	150 pounds
18 to 24 in.	*	150 pounds	150 pounds

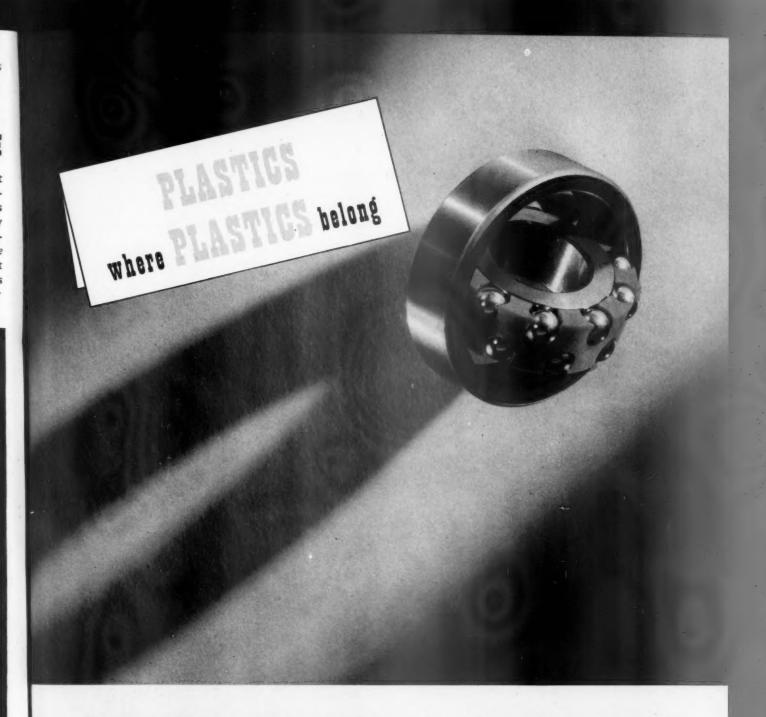
^{*}For steam lines larger than 16-inch, Crane 150-pound Cast Steel Gate Valves are recommended.

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Ill. · Branches and Wholesalers Serving All Industrial Areas









Using Strength, Lightness, Wearing Quality

STRENGTH, light weight and wear-resistance make Synthane laminated highly desirable for retainers in high speed ball bearings . . . and an excellent example of putting plastics where plastics belong.

If you haven't used plastics at all or to the fullest extent, if you are not certain *which* of the many plastics fits into your plans . . . or where . . . or why... or what the cost will be... ask us to help you, preferably before you design.

This way, if Synthane is the answer to your needs, you can be sure of design and material not only right for the application but right for fabrication. Should you, in addition, want us to take over fabrication, you can be sure your parts will be produced by men

who know machining of plastics, working on machines fitted especially for plastics. For your whole job or any part of it—design, materials or fabrication—remember Synthane. It will give you a real sense of satisfaction to know whether the job can be done, how it can be done, how long it will take to produce and how much it will cost. Synthane Corporation, Oaks, Pa.

SYNTHANE TECHNICAL PLASTICS



DESIGN · **MATERIALS** · **FABRICATION**



RODS - TUBES



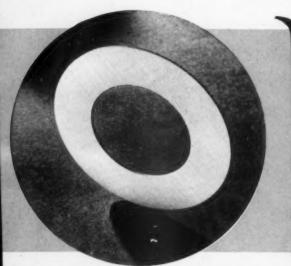


MOLDED-MACERATED MOLDED-LAMINATED

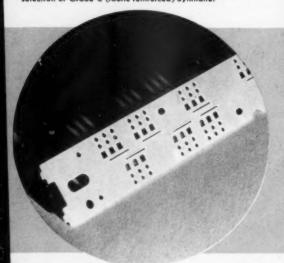


SYNTHANE

Plastics is a Word . . . like Metals



THRUST WASHER—Dimension stability, moisture resistance, compressive strength and immunity to oil are factors in the selection of Grade C (fabric reinforced) Synthane.



RADIO TERMINAL STRIP—Low power factor, low water absorption, low dielectric losses and stability of these properties led to the use of Synthane Grade XXXP.



BREAKER ARM—Synthane molded-laminated with a fabric filler is notable for its high impact strength, excellent wearing qualities and good electrical properties.

• IT IS IMPORTANT TO AVOID using the word "plastics" loosely or generically. It is as imperative to distinguish between plastics as between metals, say as between steel and bronze—and then to distinguish further between types of the same general plastics as you would between various steels and various bronzes.

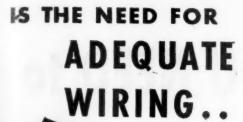
APR

- SYNTHANE IS OUR NAME for one type of plastics, made from phenol formaldehyde resins and various fillers. This type is thermosetting, that is, it does not soften under a reapplication of heat as do thermoplastic materials. The phenol formaldehydes, including Synthane laminated, are newsworthy among plastics for their combination of high tensile strength, high compressive strength, high flexural strength, high impact strength and high dielectric strength. Synthane has, of course, many other desirable properties in combination such as light weight, hardness, low thermal expansion, low moisture absorption, and resistance to corrosion.
- as there are various kinds of bronze, steel, aluminum, and other metals. Naturally, you will not find the optimum values of all properties combined in any one grade. For instance, one grade, reinforced with a paper filler, is most suitable for its mechanical characteristics, another for its dielectric qualities. In addition to paper grades there are grades reinforced with fabric, asbestos, and glass fillers and impregnated with a diversity of resins.
- THE SELECTION OF A GRADE of Synthane is influenced not only by its inherent physical, electrical, mechanical or chemical properties but often by processes of machining required to produce from Synthane the finished parts you require.
- AS AN ILLUSTRATION, production of the parts you have in mind may only be economical by punching. Depending on your requirements, paper base grades as XP, XXP or XXXP (the "P" denotes a punching or plasticized grade) may be amply adequate for your purpose.
- USUALLY ONE OF THE MANY standard grades of Synthane can be found to meet satisfactorily all your specifications, both in properties and in machinability. If not, we may have already developed, or have to develop, a special grade which will.
- REMEMBER THAT SYNTHANE is as adjustable within its combination of properties as an alloy of a metal, and that if you are not sure there's a grade of Synthane to fill the bill for you, just ask us. If possible, let us help you before you design and, in so doing, give us the opportunity to assist you in selecting the right Synthane material for your application and for ease in fabrication.



SYNTHANE CORPORATION, OAKS, PENNSYLVANIA
Representatives in All Principal Cities







WIREMOLD

CATALOG AND

No. 16 A



WIREMOLD FITTINGS

PLUGMOLD PLUG-IN-ANYWHERE SYSTEMS

"3000" SYSTEM WIRING

PRODUCTION EXECUTIVES

There are many unusual ways in which Wiremold can help you save motions, speed production and assembly through efficient "wiring for work". Write us for Wiring Guide, industrial bulletins and data sheets.





THE WIREMOLD CATALOG IS YOUR GUIDE TO WIRING PLANNED FOR TOMORROW'S NEED

Versatile Wiremold Raceways and Fittings efficiently meet the installation requirements of all modern lighting systems . . . whether incandescent, fluorescent or other newly developed light sources are used. In the Wiremold Catalog and Wiring Guide you will find the many sizes of raceway and the full range of fittings needed to plan either a complete basic wiring layout for new building construction or the wiring extension and relocation necessary in modernizing existing installations. Wiremold methods and materials are not new to you. They were your standby in prewar years. They have been widely used to speed work, save time and step up lighting standards in war plants throughout the nation. They stand ready now to become an essential part of your post-war business planning. If you have not received a copy of Wiremold Catalog No. 16A, write us at once.

THE WIREMOLD COMPANY,



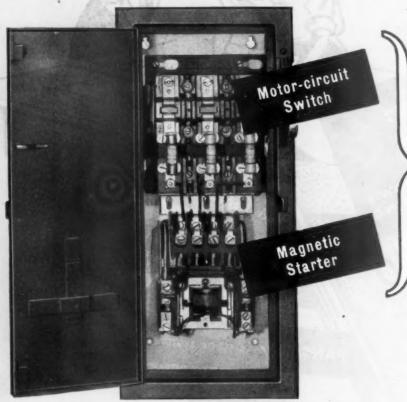
HARTFORD 10, CONN.

-BENIND EVERY

APR

EVERYTHING YOU NEED to

LIGHTING PLA



110 to 600 Volts



COMBINATION STARTER

Why two devices?
ONE can do the job.

GENERAL PURPOSE



DUST-TIGHT

FOR HAZARDOUS LOCATIONS

WATER-TIGHT



Type 1 enclosure for indoor applications where atmospheric conditions are normal. Available up to and including NEMA Size 5.



Two forms are available

Type 3 for corrosive
atmospheres; Type 8
for hazardous locations.

All arcing parts and terminals of Type 8 forms
are at least six inches
under oil.



Type 5 enclosure for use in steel mills, cement mills, and other locations where the dust content of the atmosphere is so high as to make a dust-tight case desirable.



Type 7 case for Class I, Group D, locations is made of cast, highstrength alloy. Designed to withstand internal explosions.



Type 4 case is suitable for outdoor use, and for damp places indoors, such as dairies, breweries, and piers.

control and protect your motor in ONE COMPACT CONTROL UNIT

COMPLETE full-voltage control of squirrel-cage motors or the primary control of wound-rotor motors—with extra safety, very low installation cost, good appearance, and other advantages.

Which Type Do You Need?

If you want short-circuit protection, you can select a starter which has a fusible motor-circuit switch or a breaker to provide such protection. Or, if you do not need short-circuit protection, you can choose a starter which is equipped with a nonfusible motor-circuit switch that serves only as a disconnect. Both types are available in a variety of enclosing cases, as shown on the opposite page.

Co-ordinated for Protection

With G-E combination starters. you're sure that the motor-circuit switch or breaker has the proper rating for the magnetic starter with which it is used. The fuses or breakers provide adequate shortcircuit protection to the motor, the starter, and subsequent motorbranch-circuit conductors when connected to a power supply for which they are recommended. The co-ordination of thermal overload relays with the fuses or breakers affords complete motor overcurrent protection under any condition of operation.

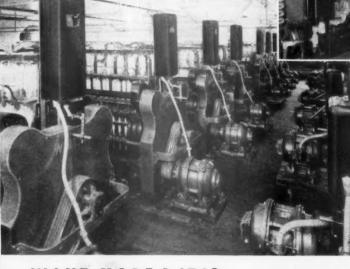
Increased Safety

By placing the motor-circuit switch

in the same case with the magnetic starter, the switch can be mechanically interlocked with the cover, so that the cover cannot be opened while there is power on the starter. This is an important advantage because, when a separately mounted switch and starter are used, there is nothing to prevent the operator from opening the case while the starter is "hot."



This combination starter controls a ball-bearing splashproof motor direct-connected to a centrifugal mash pump in a brewing plant.



G-E combination starters can be mounted on or near the machine even in damp locations, such as this pump-room installation.

Combination starters and shipper-rod switches are used to control the operation of each frame operated by this spinning-frame drive.

WANT MORE DATA? More complete information on G-E combination starters will be found in Bulletin GEA-3715. Ask our nearest office for a copy or write direct to General Electric Company, Schenectady 5, N. Y.

Every week 192,000 G-E employees purchase more than a million dollars' worth of War Bonds

GENERAL ELECTRIC

Palletizing with ADHESIVES

EXCLUSIVE

PALLET ADRESIVE # 4 was formulated in collaboration with military authorities. It is the first adhesive to be tested and approved for unitizing corrugated or solid fibre shipping containers on standard wooden pallets. Its high shear strength locks the unitized load during shipping; its low tensile strength permits easy unit separation during unloading — with a minimum of tearing that leaves the cases fit for reuse. Adhesive palletizing is now being adapted to woodee boxes.



Labor Time

Time Containers Break-up Damage Pilferage

EASY TO APPLY



PALLET ADHESIVE # 4 is applied by brush around the perimeter of the pallet. Then the first layer of cartons is placed in position.



An L-shaped strip of adhesive is then applied to the top corners of each carton — to lock the succeeding layers in place.

The SPEEDS MULTIPLE-UNIT WAR DELIVERIES

All war contractors—large or small—can now make palletized shipments whether or not they are equipped with special tools for steel strapping and mechanical handling equipment.

A fast-setting, mold-proof, brush applied adhesive... National's PAL-LET ADHESIVE #4... permits unit loading either inside the plant at the delivery conveyor — or directly on pallets in the freight car or delivery truck.

Domestic shipments to prime contractors equipped with fork-lift trucks
— or to the home depots of the
Services need no further binding.

Overseas shipments can be 3strapped (instead of 6-strapped) by the Services at ports of embarkation or by specially equipped contractors. Government specifications calling for palletized units are rapidly being extended to all contractors. The advantages of palletizing with adhesives are many: Unit loading saves time, labor, critical metal and handling equipment. Rehandling caused by load break-up is eliminated. Damage in transit is lessened. Pilfering is discouraged. And savings in container costs are made possible.

Further information is available NOW! Address: National Adhesives, 270 Madison Avenue, New York 16; 3641 So. Washtenaw Avenue, Chicago 32; 735 Battery Street, San Francisco 11, and other principal cities. In Canada: Meredith, Simmons & Company, Ltd., Toronto and Montreal.



Purchasing Previews

April 1, 1945

RECONVERSION PLANS UNDER DISCUSSION....

Reconversion talk, which had been permitted to wither on the vine, is beginning to bloom again. Basis, naturally, is the favorable military turn. Industry in U.S., Britain and Canada is eyeing events closely. There is half-hearted agreement that each of the three countries should reconvert at about the same rate.

However, reconversion has been going on apace in Canada. In fact, 1944 new plant and housing construction in Canada reached a peak. This trend contrasted with U.S. construction index, which hit a low point last year.

Presumed justification is that Canada is largely a war subcontractor, and will be hit hardest by cutbacks—therefore the industry of that country should get greater latitude in reconversion.

"B" PRODUCT OUTPUT STEPPED UP

Flowdown of orders for shelf items has increased under the program initiated by WPB and the armed services. Field check by Army Service Forces shows that "B" product manufacturers have received a greater flow of purchase orders in the past six weeks, and this is attributed to the new policy of requiring prime contractors to cover their shelf goods and material requirements by purchase order.

During the last period of 1944, trend in armed service policy was to shorten the buying cycle—and this in turn made prime contractors reluctant to place orders for parts and materials. As a result, shelf goods stocks were depleted.

To counteract this condition, policy was adopted requiring prime contractors to place orders for their material and components as far in advance as possible. Early reports are to the effect that it is working.

ARMY JUSTIFIES PROCUREMENT POLICIES.....

Army supply program is again under fire. Criticism is the recurrent complaint that the vast procurements are out of ratio to actual requirements, and that huge surpluses are building. The military procurement chiefs are prepared to show that their purchases are based on military needs.

Back in 1940, the Army had a difficult time justifying the purchase of 200,000 shirts and pants. At that time, all military purchases exceeding \$500,000 required the approval of the National Defense Advisory Commission (the evolutionary forerunner of the OPM, SPAB, and finally WPB). The Army won out on the shirts and pants over bitter opposition. This same opposition has persisted.

Facts are that the supply program is based on current and projected rate of military use—not on cessation of hostilities at any particular period of time.

WPB SEEKS TO SOFTEN CUTBACK BLOW

Production Readjustment Committee, including in its membership representatives of all war agencies, has launched a program to lessen the shock of war contract cutbacks.

Program anticipates partial reconversion by providing a routine under which the procurement offices of the Government can review plants released from war contracts to see whether they should be permitted to go back to civilian

output, or given new contracts.
WPB Directive No. 40 sets up procedure for clearance and consultation on cutbacks. Section of the directive giving industry a seven-day breathing spell on cutbacks reads:

"In order to insure adequate time for consultation, the Procurement Agencies are requested to conduct their requirements planning so as to provide as much time as possible between the notification of the contractor and the time when he is required to stop or substantially reduce the schedule of production. The Procurement Agencies will so adjust their procurement planning, procurement controls, and inventory controls as to make it possible to notify plants of work stoppages at least seven days in advance of the date of work stoppages when the cutback is over \$100,000 per month in any one of the succeeding 12 months in one establishment and will involve release of workers.

"Exceptions to this rule may be made by clearance with the Chairman of the Production Readjustment Committee. those cases where emergency action must be taken (within established procedure) in order to avoid loss to the Government due to causes beyond the Procurement Agency's control, a substantiation of the need for emergency action must be presented to the Chairman of the Production Readjustment Committee within 10 days after the date of actual

work stoppage involving the release of workers."

PRIVATE IMPORTERS BUCK FEA PURCHASE ROLE....

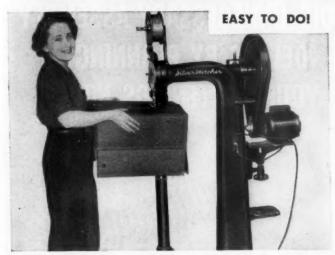
Experience of the Foreign Economic Administration as the middleman on imported commodities going into trade has not been too happy.

Where the FEA import operations have been confined to supplying war industry, the problem has not been acute. many cases, normal import channels were utilized, and the competition with private industry, either as a buyer or a seller, was not direct. However, in the several cases involving sales of consumer items, where FEA acted as a disposal agency for commodities purchased to bolster up the economy of an occupied country, the reaction by the trade involved was quick.

The trade opposed a U.S. Government agency buying consumer goods in a foreign country, and then acting as a direct sales agency to sell these goods in domestic markets.

ILVERSTITCH YOUR CARTONS

SAVE TIME-MONEY-SPEED CARTON OUTPUT



*SILVERSTITCHING—Acme's superior method of closing cartons with steel staples—can be learned quickly by any employee.



HIGH SPEED PRODUCTION—Daily carton requirements can be quickly and easily assembled from KD container board supply.



SILVERSTITCHING holds firmly in all types of box board and adds to the inherent strength of containers because stitches are scien-tifically formed, driven and clinched.



STANDARD MODELS of Silverstitchers provide fast and economical stitching for the wide range of carton sealing requirements. Models are available also for special sealing jobs.

SilverStitchers Pay Their Way!

Any business, large or small, which ships in cartons will find the answer to closure problems in an Acme Silverstitcher. Low in original cost, sturdily made, and easy to operate and maintain, an Acme

Silverstitcher stitches cartons rapidly and economically. To get all of the facts about Silverstitchers and Silverstitching write today for informative photo-filled booklet.

New Ideas for Using Steelstrap... Another Acme Product

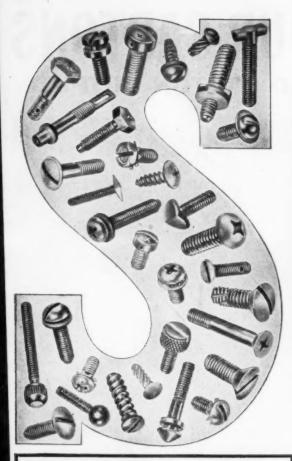


Doc Steelstrap, and the Acme engineers he represents, are busy today providing maximum protection for shipping packs bound for battle fronts everywhere. In doing so, they are solving many unusual

problems in shipping pack protection and reinforcement. Therefore, in the post-war era, they will be able to show you tested methods for making shipments of your products . . . from single containers to carloads "Bound to Get There" . . . safely!

2842 Archer Avenue, Chicago 8, Illinois Also manufacturers of Acme Steelstrap and strap applying equipment

yo



3 Standard Fastenings for Production Efficiency



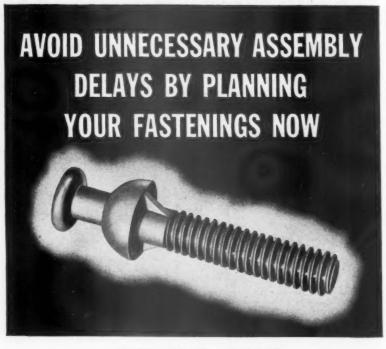
Phillips Recessed Head Screws—The modern, effective, time-saving fastening device proven in tens of thousands of assembly lines. Other standard head styles are also



2 Self-Tapping Machine Screws—Eliminate separate tapping operations for fastenings to castings, heavy gauge sheet metal, and plastics. Also available with Phillips Recessed Head.



Washer-Screw Assemblies—When use of lock washers is indicated, the timesaving of pre-assemblies is obvious. Also available in standard slotted head styles.



"Cold-forging"— proof #30

Forethought, when your product is still in the design stage, can mean timely delivery of fastenings for that "long planned" fast assembly job. Your early and precise choice of fastenings—standard or special—may be vital to the fast and exacting assembly job required for an advantageous start on postwar production.

That's where Scovill comes in ... our broad experience in fastenings and ingenuity in special design qualify us as specialists in the fastenings field. Let us help you determine the best modern fastenings to use —a featured standard fastening or a part especially designed to suit your needs.

The part shown above is one of Scovill's many special purpose cold-forged items. Our special processing of this part meant substantial savings in money—materials—motions. Call our Fastenings Expert for assistance so that you likewise may profit. Call him now.

SCOVILL MANUFACTURING COMPANY WATERVILLE SCREW DIVISION

WATERVILLE 48, CONN.



TEL. WATERBURY 3-3151

NEW YORK, Chrysler Building . DETROIT, 714 Fisher Building . CHICAGO, 1229 W. Washington Boulevard . PHILADELPHIA, 18 W. Chelten Avenue Building PITTSBURGH, 2882 W. Liberty Ave. . SYRACUSE, Syracuse . Kemper Insurance Bidg. . LOS ANGELES, 2627 S. Soto St. . SAN FRANCISCO, 434 Brannan St.



Let us talk it over...

Let us explain the many advantages of Hydrogen Copper Brazing; how it often makes possible the substitution of stampings for expensively machined forgings, how it assures precision and greater strength, reduction in weight and lower costs. These facilities are a part of Burgess-Norton's complete facilities for the production of hardened and ground screw machine products, steel stampings, piston pins and ball bearings. Write Burgess-Norton Mfg. Co., 200 Peyton Street, Geneva, Illinois.

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MANUFACTURING COMPANY

40 years in GENEVA, ILLINOIS

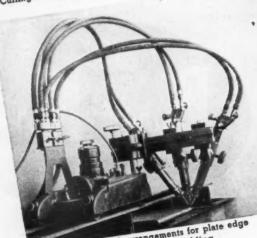
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A Part is Never Made Right Unless it is Satisfactory to Our Customers

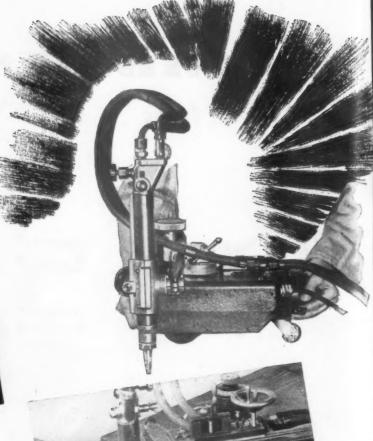
THESE



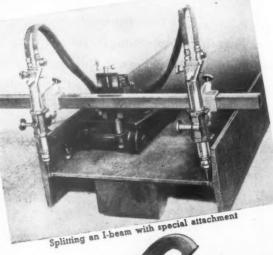




Three torch arrangements for plate edge preparation for welding



Cutting a circle





fellows.

do many metal cutting jobs faster — more economically

Need a couple of six foot circles of 1" plate, a few three inch washers? Want to split up a big steel plate and bevel the edges for welding or cut up some structural shapes?

An Airco Radiagraph — one of Airco's small portable gas cutting machines — will do any of these jobs — and many more — and do them faster and more economically.

Operating on steel tracks furnished for five foot cuts, they will make straight cuts of unlimited length in one continuous operation when tracks are progressively positioned.

With an adjustable radius rod and center point, they will cut circles from steel plate of any thickness in a wide range of diameters.

With a side roller attachment and template shaped to guide the machine, long, sweeping curves may be cut.

The torches are adjustable to permit a perpendicular cut or one of any desired bevel. A second torch can be mounted on the machine for the cutting of two parallel straight lines with double

bevel or two concentric circles simultaneously. A third torch can also be mounted on the machine for simultaneously cutting a double bevel with land to prepare plate edges for welding.

A conveniently-located indexed speed control permits the operator to increase or decrease the speed of the machine at will.

Airco Radiagraphs are made in two models, the No. 10 (weight 41 pounds with torch) and the No. 4 (weight 74 pounds with torch). Each machine is available in several speed ranges within the limitations of 2" per minute minimum and 50" maximum for the No. 10's and a minimum of 1½" per minute and a maximum of 75" per minute on the No. 4's. Both models are sturdily-built and dependable.

• For copies of folders containing full details on these two gas cutting machines, ask your nearest Airco office or write Dept., Air Reduction, General Offices: 60 East 42nd Street, New York 17, N. Y. In Texas, Magnolia Airco Gas Products Co., General Offices: Houston 1, Texas.





For your plant or for use as built-in components of your product, Graybar offers General Electric motors of both integral and fractional horsepower types — and matching control units, including the latest electronic types. Today, for essential war uses . . . tomorrow, for every motor need. A Graybar Power Apparatus Specialist in your area is ready to give you experienced aid in their selection and application. Graybar Electric Company, Graybar Building, New York 17, N. Y.





Source of Supply

In Over 80 Principal Cities

PURCHASING

The National Magazine of Industrial Purchasing

APRIL, 1945

VG.

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PURCHASING is an independent journal not the official organ of any association. It is the only publication of national scope devoted exclusively to the interests and problems of the purchasing executive in industry and government. Established 1915 as "The Purchasing Agent." Consolidated with "The Executive Purchaser."

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A plan that will benefit veterans, America and you

● You'll be seeing "MEN WANTED" signs on highway, road and street construction jobs all over America when peace comes.

A bill has been passed which authorizes the pending of a billion and a half dollars of federal noney on a postwar highway plan. To receive its hare of these funds, each state must vote an equal mount of money for the program.

This plan, sponsored by the American Road Builders' Association, will benefit veterans because is calculated to provide jobs for 3,000,000 men actual highway construction and for many more

in durable and consumer goods industries.

It will benefit all America by providing the modern highways, roads and streets needed for postwar business and recreation.

The plan will help create a prosperous postwar economy by its need for many products.

This vital plan for providing employment for returning soldiers is fully described in an informative illustrated booklet entitled, "THE ROAD AHEAD." Write for your free copy to the American Road Builders' Association, 1319 F Street N. W., Washington 4, D. C.



Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Bridgeport, Conn.

AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety



DISTRIBUTION MOVES MATERIALS

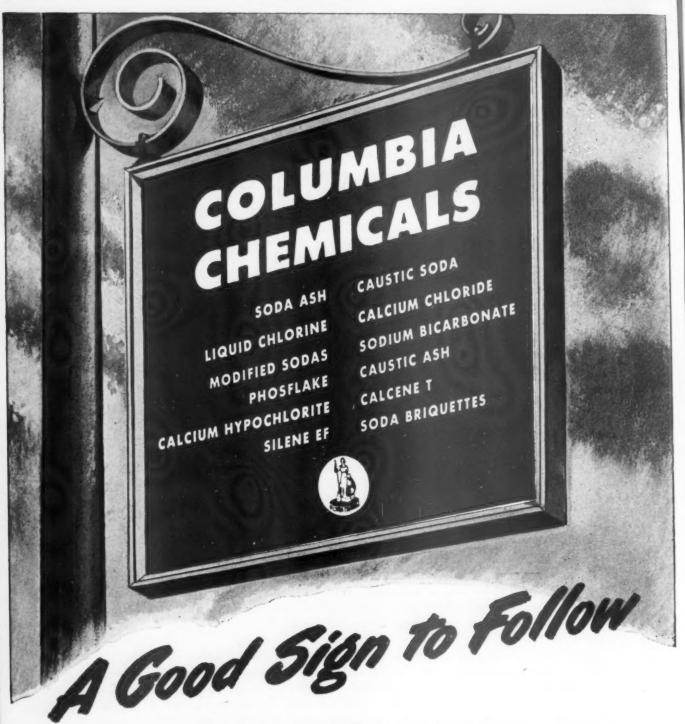
In accordance with the dictum of the Surplus Property Act, that small business is to be favored and in no respect to be discriminated agains', the men in charge of surplus disposal have done their best to channel salable merchandise to the shelves of the little retailer. At the same time they have been determined to eliminate the high cost of distribution—not unaware that industry has been wrestling with this problem for many years, but still not convinced that industry has found a proper solution. Put the two objectives together, and you have a vigorous indictment of the distribution system so far as it concerns the jobber and his services. Consequently every effort has been made by government to deal directly with the little man, with one fixed price for all.

But these well-intentioned efforts have produced headaches, paper work, repacking, and added costs instead of sales. The small retailer wants to see a sample. He cannot visit government warehouses in distant cities, or buy on a "where is, as is" basis. His conception of a "lot" does not coincide with warehouse practices and doesn't make much of a dent in surplus inventories. He thinks in terms of dozens instead of hundreds or thousands. And he needs credit.

The straw that broke the camel's back, we are told, was an order for a hundred china cups, which raised the problem of attacking 30,000 barrels of assorted chinaware in a distant Army warehouse. Surplus property officials decided then that they had put themselves into the retail business on their own account, and were losing money on the deal.

Present policy contemplates greater use of established jobber channels, and sales in wholesale quantity lots. Fixed prices will be adjusted to various levels of trade, with appropriate differentials for services actually rendered in distribution. It has been discovered that the high cost of distribution is low in comparison with the cost of eliminating the middleman, and that a distribution system is necessary in order to move merchandise.

Stuart F. Nemit



Columbia products meet your most exacting requirements . . . Columbia policies contribute to enduring business relationships. Well located plants and excellent distribution facilities are other important factors in the selection of Columbia as your source of alkalies and related chemicals.



PITTSBURGH PLATE GLASS COMPANY COLUMBIA CHEMICAL DIVISION

GRANT BUILDING . PITTSBURGH 19, PA.

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PHILADELPHIA • MINNEAPOLIS • CHARLOTTE • LOS ANGELES



A brief summary of outstanding features of timely interest and importance in this issue, to conserve the time of busy readers



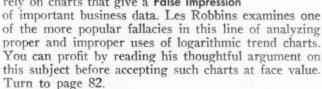
If you are thinking of expanding, modernizing, or reconverting your plant, now is the time to plan the power lines and to select the Most Economical Voltage for the new equipment. D. L. Beeman analyzes this problem from the viewpoint of the medium size plant and presents some

definite and practical recommendations that are well worth study by purchasing men and management. They are supported with the latest technical data and actual test results. His article appears on page 105.

When a manufacturer of factory and office forms decides to eliminate a standard form from his own procedure, it sets a precedent that may well cause every form user to sit up and take notice. The Purchasing Agent of The Standard Register Company has found that he can improve control of materials and simplify purchasing routine by using a **Perpetual Bill of Materials** in place of the traditional repetitive requisition for every purchase order. The new system is described on page 75, with a purchase flow chart to illustrate how it works.

Business law depends not only on the statutes, but even more on the interpretation placed on them by the courts. More and more, precedent is giving way to a changing modern viewpoint, and the recent verdicts are the ones that count. Leo T. Parker has compiled a summary of important **Decisions of 1944** relating to the law of sales and purchasing. Bring yourself up to date by reading his article on page 102.

A lot of business men—and that includes some Purchasing Agents—are dazzled by elaborate charts, without taking the trouble to analyze whether or not the graphic scheme is appropriate to the subject matter that it presents. As a result they may rely on charts that give a Folse Impression



The concluding article in Miss O'Connor's authoritative series on Governmental Purchasing (page 111) directs a searching gaze upon the future. Which philosophy will prevail—regimentation or businesslike efficiency?

There's been a lot of favorable comment on George Stone's little folder for getting better cooperation from plant men, described in the January issue. He has a follow-up in a new folder with the provocative title: Do You Need A Job? It is presented on page 110.

This month's guest editorial by N.A.P.A. Vice President George Mercer, of Indianapolis, deals with the Purchasing Agent's part in the post-war plans of his company. His statement, on page 71, tells what progressive purchasing executives are thinking about in these days.

The U. S. Navy has an inventory problem that involves literally millions of items located all over the globe. To handle this immense and complicated situation, the responsibility for Inventory Control has been centralized, providing a sound factual hasis for a program It is



basis for a procurement program. It is described on page 96, by the officer assigned to the task of organizing and administering this control—an officer who, by the way, received the Legion of Merit award and an official citation for his accomplishment in the Navy's service of supply.

W. J. Roemer's article on page 85 is more than an outline of procedure. It is a story of the building of a Centralized Purchasing Department to maximum usefulness, starting from scratch, by a progressive and resourceful executive whose previous training in the sales department gave him a deep-seated conviction of what a good purchasing department ought to be.

Progress in manufacturing methods and the utilization of materials have made such strides in recent years that the greatest potential improvement in many plants now lies in the field of Materials Handling. On page 72 R. W. Mallick tells something of what they have learned and what they have done about it at Westinghouse.

Don't overlook these monthly departmental features compiled especially for purchasing men—the Washington Letter on page 55, with its timely and authoritative preview of official trends on matters affecting industry, as gathered by our Washington office; the listing of Know-How Information, that is yours for the asking, appearing on page 10; and the illustrated summary of New Products and Ideas that are now available for the industrial buyer (page 116), providing a quick and convenient means of keeping up to date on recent developments.



No!—buyers don't run to the 11 Ryerson Steel-Service Plants to buy steel, as they do to a cigarette counter when the "in stock" sign is out... but we sometimes have almost as much difficulty keeping up with demand. Every week thousands of orders speed steel from Ryerson stocks to war plants and essential industries throughout the country.

Why?... The reasons are simple and basic. Ryerson plants stock more than 10,000 kinds, shapes and sizes of steel... Service is personal, intelligent and helpful... Equipment and "knowhow" are at hand to cut and otherwise prepare steel the way you want it... Deliveries are quick. But most important is Ryerson dependability, demonstrated by 102 years of steel service, and the determination to deliver to you, if humanly possible, the steel you want when you want it.

If you do not have a copy of the latest Ryerson Stock List, call or write your nearest Ryerson plant today. You'll realize what we mean by

10,000 kinds, shapes and sizes of steel when you use this complete guide to the nation's largest steel stocks.

JOSEPH T. RYERSON & SON, INC. Steel-Service Plants: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston.



RYERSON

BARS . SHAPES . PLATES . SHEETS . TUBING . STRUCTURALS . CARBON

AND ALLOY STEEL . TOOL STEEL . ALLEGHENY STAINLESS

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R ECENT military developments have resulted in increased demands for ammunition and nearly everything else required for the prosecution of the war. To the Purchasing Agent these developments have brought renewed shortages, longer delivery schedules, and tighter allocations. They may make a discussion of Post-War Planning appear inappropriate at the moment.

The final result of the war is inevitable. We can be sure that the Post-War Period will arrive some day. The actual date is unimportant from the standpoint of considering the Purchasing Agent's part in the Post-War Plan. The Purchasing Agent who does not keep abreast of all developments will find himself in a very difficult position.

He must be particularly alert in the allocation of his time and energies. He cannot neglect the main job. He must keep his plant supplied with materials to take care of continuous production of war products which are being demanded in greater and greater quantities. At the same time, to protect his Company and his job, he must find time to keep well informed concerning Post-War developments. The amount of time and the type of study of the problem demanded will vary for each Company. It will depend on a great number of factors, including his plant reconversion problem, the types of products manufactured by his Company, and many other things, even including the philosophy of his own management in respect to Post-War Planning.

Only through contacts with his vendors, close attention to developments in Washington, careful study of trade and industry report, trade papers and other media, will Purchasing Agents be able to keep up to date, adhering to and effectuating the policies of their Companies. They must be in position to go forward with minimum confusion when the Post-War Period arrives. Material available to all members of the Purchasing Agents' Associations, through the National Office, will prove most helpful.

In the last analysis, study of available data will enable the Purchasing Agent to keep current in a general way only. Since the problem of each plant is individual, he also must take time to plan for his own Company. If the Purchasing Agent does not do just that, he will find someone else doing the job for him. It must be done if his Company is to survive when the "Survival of the Fittest" economy again emerges.

The Purchasing Agent's Part in The Post War Plan

The buyer has a three-fold responsibility to maintain war production, to appraise the market probabilities of the post-war world, and to apply these to his company's position

By GEORGE C. MERCER
Purchasing Agent, P. R. Mallory & Company, Indianapolis



Materials Handling at Westinghouse

By R. W. MALLICK
Westinghouse Electric and Manufacturing Company
East Pittsburgh, Pennsylvania

UNTIL just a few years ago, the relative importance of materials handling has not been fully appreciated by industry in general. This is probably best illustrated by the fact that materials handling today still constitutes the greatest single item of labor cost in most industries, and yet the engineering effort being put forth to solve this problem is not in direct proportion to the effort being put forth in other fields.

As the world's leading industrial nation, we have, in the last century, concentrated most of our engineering effort as applied to industrial manufacturing to improved methods, materials, and designs of tools and machine tool equipment. We did this because tooling is of importance to the production of articles being manufactured. The effects of tooling can be readily visualized.

Greater Production

We do not wish for one moment to minimize the importance of machine tools and production tooling. We do wish to emphasize, however, that our technical progress in the application of tooling and materials handling to industry has gotten out of phase. We quote the following excerpt from Materials Handling Handbook, published in 1940:

"The result is that many industrial plants have so extensively modernized their machinery without equivalent modernization of their materials handling methods that further gains in manufacturing efficiency are easier to achieve by revamping their materials handling methods than in another way.

"When this is the case, it is usually revealed most frequently during periods of business expansion when pressure for larger production stimulates a search for a way and means of getting more output from a plant that is already apparently operating to capacity." This statement is further substantiated by the report of the U. S. Committee on recent economic changes.

Quoting the same publication, it says: "In such instances, an analysis often reveals that the plant is operating far below its true capacity. A

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false appearance of the activity is created by congestion of material between departments and around machines awaiting upon a handling system that has grown inadequate for increased flow of work."

Materials handling definitely affects not only the cost, but many other operation conditions. We have developed an axiom which can be stated as: "The time required and the distance traveled in the course of manufacturing a product directly affects the cost." By the same token, the quality of a product is jeopardized each time it is necessary to handle it.

Materials handling is most frequently a source of industrial accidents. If you will review the lost time accident reports of manufacturing industries, you will find that materials handling is one of the greatest contributors. This not only affects the cost, but affects the workers' morale.

Sound Engineering

Let us evaluate the effects of sound engineering in our industrial system. One of the photographs herewith illustrates the design features of a modern engine lathe. The parts and examples which surround the assembled machine are relatively few and simple in their individual form; yet the machine tool industry necessarily employs the finest kind of engineering talent to design such a machine.

A second illustration shows a

A second illustration shows a modern industrial plant. Grouped around it are some of the products and services and facilities that must be carefully engineered to make that plant an efficient production machine. Note the complexity of the problem of designing the plant, yet, many industrial concerns employ a far lesser calibre of talent to design the adequacy of complete plant than would be employed in designing a single machine tool.

Unfortunately for industry, all that is necessary to produce almost any industrial product is a superabundance of buildings, equipment, men, and materials. With these conditions, you do not need an efficient

FIG. 2 vivid preview of the co

plant layout. As stated by one of our educators, "Anyone can build a bridge if he uses enough steel, but it takes a good engineer to design one with just enough of the right kind of steel in the right places to give a good structure."

Here at Westinghouse, we operate one of the most diversified manufacturing industries in America, Our handling problem ranges from the transportation of extremely delicate, tiny instruments to power generating equipment weighing several hundred tons. The quantities handled range from one huge part to literally thousands of pieces. The rate of movement of material varies between both extremes. Two of the photographs accompanying this ar-

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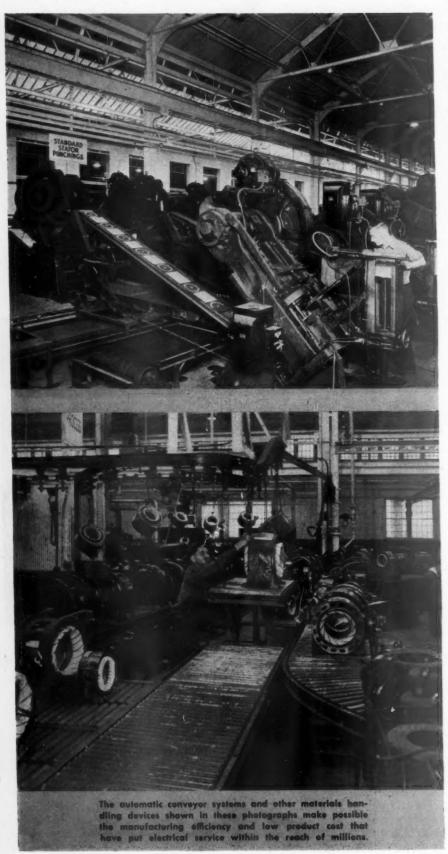
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ticle illustrate some of our more modern materials handling equipment, as well as typify a trend.

You are all interested in knowing what the future holds in the way of management attitude and engineering possibilities for a more intensive application of materials handling in industry in general. At the recent annual meeting of the American Society of Mechanical Engineers in New York, one entire day was devoted to the study and discussion of plant layout and materials han-dling problem. This Society, one of the most prominent in our nation, has shown definite recognition of the importance and value of these fields of engineering and the need for more intensive development of our industrial planning. The American Society of Tool Engineers likewise has recognized the importance of industrial planning.

A recent development which should add materially to the selling of improved designs of plant arrangements and materials handling systems is the use of three dimensional presentations. One of the handicaps which plant layout and materials handling engineers will always encounter is the difficulties of presenting their plans to management and non-technical personnel not thoroughly conversant with engineering language and engineering drawings. The value of this feature in industrial planning was also a topic of keen interest at the recent meeting of the American Society of Mechanical Engineers. Several large manufacturers of equipment are already featuring the availability of models of their products and it is reasonable to expect that before long this trend will spread throughout

the industry. This method of presentation improved the visualization of plant designs, as shown in the ica

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photographs on page 73. Here at Westinghouse, we have acquired a deep cognizance of our problems and expect to take full advantage of the benefits afforded by the application of sound engineering to industrial planning. While we fully appreciate that due to the diversity of our manufacturing, we cannot hope to achieve the levels of efficiency possible in more standardized mass production industries; we nevertheless expect to make full application of sound engineering commensurate with the benefits to be derived from good planning. In our endeavors, we look forward to extensive cooperation with you upon whom we depend to provide us with the most modern equipment to ful-

fill our needs.

APRIL

Procurement Based on Perpetual Bill of Material

E LIVE ON PAPER." No more dramatic statement of the essential value of paper could be made than this statement by Donald Nelson.

Today more than ever, the American people are "paper conscious" because of the shortage, and for the first time in the history of the United States the public realizes the need for paper.

A piece of paper starts, accompanies, and completes—directly or indirectly—every transaction in the routine of modern civilization. Eventually, verbal orders become written orders and written records. Paper becomes a basic essential. Orders whether for transmittal, production, shipment, billing, selling,

Purchasing Agent and Supervisor of Materials Division The Standard Register Company Dayton, Ohio

The purchasing system described in this article is of particular interest since it is "the doctor's own prescription" - designed for the company's own use by an organization widely known and experienced in the design of forms and systems for its customers. Faced with a particular problem in its own purchasing procedure, the systems experts have developed a routine that departs somewhat from the traditional method of purchase requisitions, but has proved its worth in meeting every functional need with greater efficiency.

buying, and many others too numerous to mention, must be put on paper. Add up the ordinary business paper work, or "red tape" as it is commonly known, for the maintenance of 40 million homes controlling 30 million workers who produce 8 million material items for the 12 million men and women in the military services. Yes, "we live on paper."

At The Standard Register Company, the Purchasing Department is grouped with the Material Control, Receiving and Stores Departments under one General Supervisor. The department is known as the Materials Division. This combination, with centralized responsibility, has resulted in better cooperation, speed and accuracy, plus a net saving in material, manpower and machines.

A thorough, methodical step-bystep analysis of all the paper work through the entire division has been made and charted so that continual study can be made for future improvement. The objectives are to overcome tradition, eliminate or revise outmoded routines and records, and get rid of the wasteful habit of merely passing paper from the right hand to the left.

By GEORGE LEBERT

This flow chart is illustrated herewith. It provides an outline for the procurement, receipt, storage and use of paper for production, since we are manufacturers of a specialized type of business form. Therefore, our chief raw material is paper. All printing production is custom made to the customer's individual requirements.

The paper required is held in reserve by perpetual inventory. All

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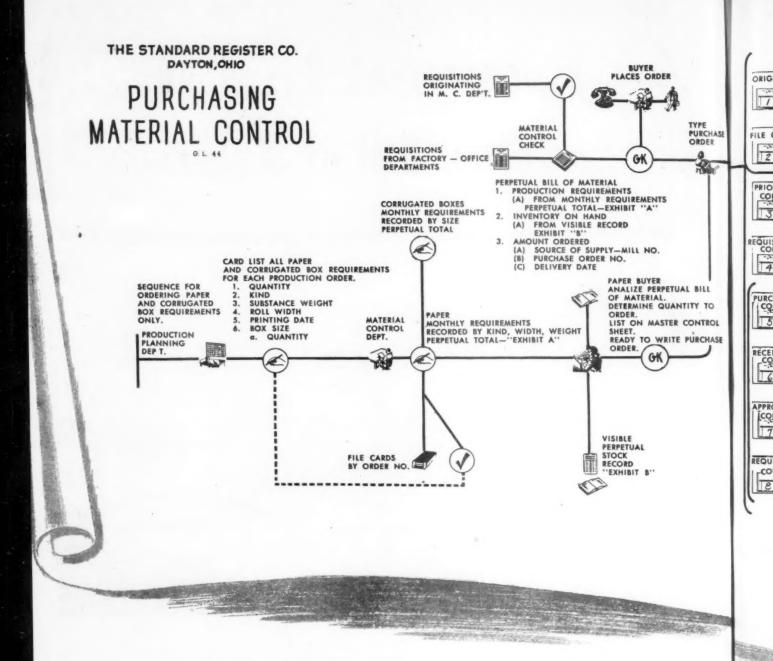
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This flow chart illustrates the sequence of operations in material control and purchase of paper and corrugated box requirements. The section on the left hand page shows control effected by use of Perpetual Bill of Material; and the right hand page shows distribution of eight purchase order copies.

stock is in rolls for web printing. It is made to order at the paper mill, with most purchases confined to carload lots. With a wartime production impetus, new and special requirements, and regulations covering usage and inventory as well as purchase, the old conventional method of placing requisitions in the Material Control Department, based on maximum and minimum limits and the record of past usage, was discarded in favor of the new method here outlined.

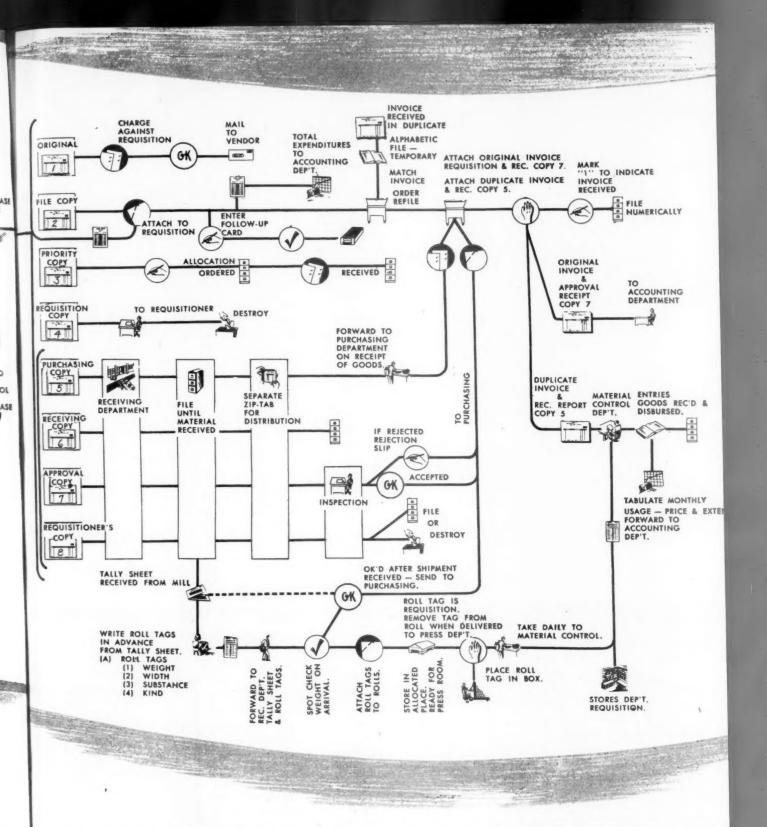
What Is Needed and When

First step in this system is a complete and accurate record of requirements. The Production Planning Department furnished the Material Control Department with a card for each order placed into production, listing the factory production order number, complete material specifications, and printing data. These cards are then tabulated by individual kinds and sizes of paper, and by the month required. (Exhibit A)

Each succeeding entry is added to the last figure, thus maintaining a perpetual total for each month's scheduled production. Changes in printing dates or cancelled orders are added to or subtracted from the last figure on each size as this information becomes available, so that the total always conforms to the projected production schedule.

What Is in Stock

The Material Control Department maintains a perpetual record, in vis-



ible index form, of the inventory of all papers in stock. This form shows the quantity (number of rolls and weight) received and on order, with order number and date, and a record of disbursements. As these entries are made, the balance on hand is computed and entered. (Exhibit B)

Perpetual Bill of Material

The unique feature of this system, as a purchasing tool, is a consolidated record known as the Perpetual Bill of Material, which shows on a

single sheet the complete picture of requirements and supplies of each grade of paper for a three-month period, for ordering purposes, making it unnecessary to issue individual requisitions to order and then to analyze and correlate these separate requisitions.

The Perpetual Bill of Material is a sheet $8\frac{1}{4} \times 10\frac{1}{2}$ inches in size, punched for ring binder. (Exhibit C) Three lines in the heading of the form show, for each purchase order placed: the vendor or mill

(coded by number for convenience), the purchase order number, and the shipping date. Each horizontal line is devoted to one size of roll in which this grade of paper is used. For each of these items, three basic facts are shown:

- (A) The last figure shown on the requirements record for the next 90 days planned production, by months.
- (B) The last figure on the stock record, showing present balance in inventory.

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(C) A record of all unfilled purchase orders outstanding, showing vendor, order number, date of shipment, and quantities on order.

The above information, all recorded in pencil, and revised each week with the up-to-date last known total of what is needed, in stock, and on order, is constantly at the paper buyer's disposal. Reviewing the entire bill of material by grade and by size, he determines the quantities to order, taking into consideration the ability of the various mills to deliver, all of which is previously arranged on contract or by allocation. It is necessary to group sufficient quantities of the various sizes to meet mill requirements for paper machine trim and to make sufficient quantity runs and carload lots. On the bill of materials, quantities to be ordered are filled in the ordering columns and remain there until the order is received, meanwhile serving as a quick means for follow-up.

The purchase order is written from the bill of materials, with items such as price, terms, shipping instructions, etc., taken from charts readily prepared for these operations.

Purchase Order Combined with Receiving Set

The purchase order is an 8-copy set of continuous forms, comprising (1) the original, or vendor's copy, (2 and 3) Purchasing Department file copies, (4) requisitioner's copy, (5) purchasing copy of receiving report, (6) file copy of receiving report. (7) approval copy of receiving report, and (8) requisitioner's copy of receiving report. Price data is blocked out on the last five copies.

It will be noted that this form, in a single set and prepared with a single typing, serves the dual purpose of purchase order and receiving report. The last four copies are stapled together at the upper left hand corner, with interleaved carbons, and are sent to the Receiving Department as a unit. The corner of the sheet is diagonally perforated, so that when the entries have been completed this "zip-tab" and the

This Purchasing System has resulted in

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Cooperation Speed Accuracy

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Manpower Machine Work staple and carbons are readily detached, leaving the four copies separated for distribution.

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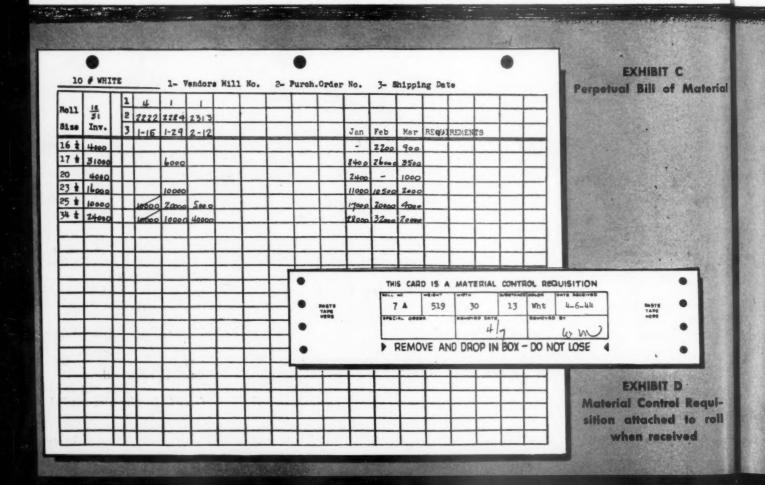
The flow chart covering the purchase of paper shows how these eight copies are dispersed and routed to perform their specific functions. It clearly indicates that since the Materials Division is responsible for all the functions of purchasing, material control, receiving and stores, the amount of paper work necessary from requirement to process has been reduced to a minimum.

Stores Requisition Made in Advance

Each vendor, at the time shipment is made, mails detailed packing slips showing the kind, size, roll weight, and roll number for purposes of identification. From these packing slips, and before the shipment arrives, the Perpetual Bill of Material is checked to show the order in transit, and a series of continuous tags (Exhibit D) are typed, one for each roll listed on all packing slips. Upon completion, the tags and packing slips are forwarded to the Receiving Department awaiting receipt of the shipment.

In unloading, the roll ticket is matched to the given roll as numbered, pasted on the outside wrapper, checked from the packing slip, and the rolls are placed in the allo-

cated storage.



The packing slip and the receiving report copies of the purchase order are then forwarded to the Purchasing Department for attachment to the invoice. When approved, the original is forwarded to the Accounting Department and the duplicate copy of the invoice and the packing slip go to Material Control for entry on the perpetual inventory stock records.

The value of these identifying tags appears when the paper is issued from stores to production. On calls from the Press Room, rolls are delivered, at which time the roll tags are removed. Serving as a stores requisition, the tag is sent to the Material Control Department and deducted from the perpetual inventory stock records.

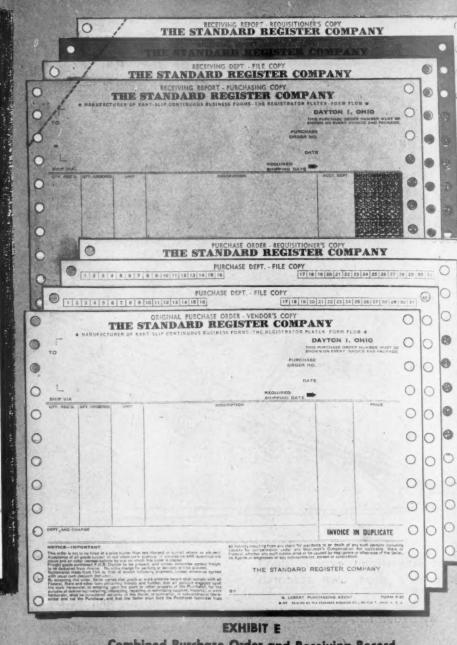
Throughout the entire procedure, the fact that simple records show what is required and when, what is in stock and on order, has helped to eliminate unnecessary paper work and maintain proper control in coordinating raw material with pro-

duction needs.

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One of the basic rules of successful purchasing is: "Don't complicate your job with unnecessary red Yet bear in mind that orders tape." must be put on paper somewhere, sometime, somehow, to prove that "how much of what you bought today won't you have when what you bought has been used.'



Combined Purchase Order and Receiving Record

DISSURSEMENTS BALANCE DISBURSEMENTS BALANCE EXHIBIT B BR MG ROLLS WEIGHT 142 44 217 L 2176 11 4036 361.24 11/2/44 **Perpetual Inventory** 97 34354 81 30716 16 1/4" 17 1/2 400 boo 1600 3600 8400 2400 20 450 1650 300 3800 4500 4800 Loo 8000 9000 11900 23 1/2 9000 11000 10000 - 14000 17000 34 1/4 8000 - 10000 - 14000 - 1600 28000 White 17 1/2" 10# EXHIBIT A Requirements Record

January





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Some advertising experts don't believe in their own research

By STUART F. HEINRITZ

GOOD many people who are interested in better and more effective industrial advertising have in recent months taken the very logical step of inviting representative readers of their advertising copy-engineers, production men, anl purchasing agents—to meet with them and tell them frankly what they look for in advertising and to point out what it is in an ad that induces them to some action. These men do not volunteer for the service, panting to get to the rostrum; they are invited guests speaking to a definite assignment for which their hosts consider them qualified. They do not pose as experts on advertising. They have two important contributions to make to a study of advertising-an expert personal knowledge of how industrial products are bought, and testimony as to the impact of specific advertising copy upon themselves as individuals. They claim nothing more than this. I know, because for four of these recent meetings I have been asked by the advertisers to suggest representative purchasing men and to prevail upon them to do the job. They have been willing to undertake these assignments, to take time out from busy work schedules for preparation of their talks, and to spend a precious evening with an alien professional group, because they too are interested in better and more effective industrial advertising, which is one of the important tools of the buying job.

But it has irritated one anony-

But it has irritated one anonymous columnist and self-appointed expert critic of advertising, who signs himself "The Copy Chasers" and conducts a monthly symposium in *Industrial Marketing* under the title "O. K. as inserted". His irritation reached the blow-off point in the February issue, and the explosion starts off: "We're just about fed up with 'consumer juries'."

Mr. The Copy Chasers is irritated to the point of utter frankness, to the confession that "the reason we are upset over the popularity of consumer juries is that we disagree violently with what the juries say, and we know that we know more about advertising than they do . . . So these fellows, as little as they know about the fundamentals of somebody else's profession, are daring to fly in the face of proven performance, the text books, the ABP, the successful agencies, yes, and The Copy Chasers."

Freedom of thought has no place in this critic's charter. Has industrial advertising arrived so close to Hollywood smugness that none but Yes men are wanted? Are readers invited, not to express an honest opinion, but to operate an "O.K." rubber stamp such as appears-with unpremeditated propriety - in the heading of The Copy Chasers' column? So far as this self-admitted expert is concerned, the answer unfortunately is "Yes", but his assertion proves nothing more than that he is out of step with the field he presumes to represent. Industrial advertisers, as a group, admit that they still have something to learn, and in spite of his ranting they will progress toward better and more efficient advertising because they maintain that open mind. The ABP

itself, which he cites on his side, has even since his blast set up a consumer jury for its Third Annual Business Paper Advertising Competition, consisting of equal numbers of qualified purchasing agents, production men, and advertising agency men. Qualified, of course, each in his own field, to express an opinion from that viewpoint.

And their viewpoints are important. For whether you like it or not, Mr. The Copy Chasers, the test of effective advertising (i.e., good advertising) lies in its impression on the reader. If it fails there, all the kudos of the professional critics and all the mutual admiration of its creators cannot make it a good ad. And if it impresses the reader whose business it is to learn about industrial products and to buy them, then all your belittling of "the copy which would get our vote in any contest for the dullest of the year" has no meaning whatsoever; it's still an effective ad.

The bathtub tenor may please himself immensely, yet produce only a disagreeable noise in the ears of his neighbors. But Melchior and Sinatra, who have attuned their vocal chords to the ears of their respective audiences, are the ones who draw the customers and the dollars to the box office. When a purchasing agent approves "two ads which—there is no question about it-definitely disobey the good rules of industrial advertising" and acts upon his approval, those ads have done the job for which they were intended. The old business adage that the customer is always right-well, nearly always-is good sound, hard common sense, and the customer's opinion will continue to confound the voice of the experts even in that happy day when "out of the great fund of advertising experience, some day an advertising science will emerge." And by the way, where is that fund of experience to be gained other than from the response of the customers?

By a quirk of magazine make-up, the blast against consumer juries is sandwiched between two full-page advertisements that have also given thoughtful attention to this basic problem. One of these pictures shows a successful sales executive getting a consumer reaction to his product at the point of sale, in the purchasing agent's office. "P. A. spells Powerful Ally to me! After selling mechanical steels for the past 18 years, I sincerely believe," says Mr. Val Hansel, Manager of Sales, Peter A. Frasse and Co., Inc., "that Purchasing Agents are just about the most

powerful allies an industrial can have. That's why my men and I always try to see to it that Purchasing Agents in our territories get what's absolutely necessary to make this alliance effective—a complete and meaningful presentation of the facts about our products." Mr. Hansel doesn't consider it good business to belittle the consumer.

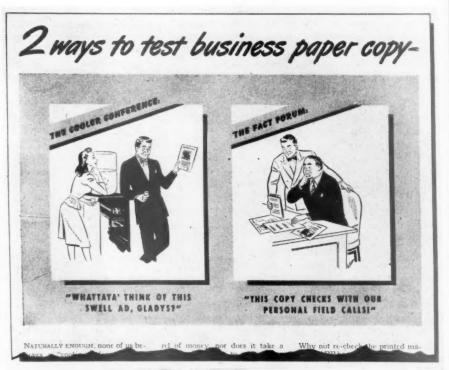
And on the other side of the article is the advertisement of the Associated Business Papers, whom Mr. The Copy Chasers himself has called as a witness. The testimony concerns "Two ways to test business paper copy—the cooler conference, and the fact forum." The message is so sound, and so appropriate, that the illustrative heading is reproduced herewith, with consent of the ABP. The copy starts off by saying: "Naturally enough, none of us believes a 'cooler conference' ever added a jot to the effectiveness of business paper copy. But field call work, boy! there you've got something! After all, how can you tell what your prospects want to know about your products unless you ask them?

Advertising copy is a product, and the readers of advertising are prospects. It is hardly cricket, Mr. The Copy Chasers—and it is considerably short of ordinary intelligence—to ask them and then to boo and belittle if their answers don't coincide with your expert opinion of what and how they should be told. And as for the value of a one-man cooler conference . . . !

Mr. The Copy Chasers doesn't like consumer juries because he says they feel an obligation to be "positive" and "pontifical". Positive, yes; if they didn't have a positive opinion to express there wouldn't be any testimony. But pontifical? That world is defined as "having the pomp, dignity, dogmatism, etc., of a pontiff". And where, I ask you, will you find anything more pompous and dogmatic (though sadly lacking in dignity) than these pronouncements of the expert himself: "the criticisms are utterly unreli-able", "we know that we know more about advertising", "daring to fly in the face of . . . The Copy Chasers", "there is no question about it", "dullest of the year", or, for that matter, this whole idea of bestowing a pretty star upon advertising copy that meets with Mr. The Copy Chasers' august approval?

Mr. The Copy Chasers resents the very suggestion that any outsider should, even upon invitation, invade the sacred field of his own expert-But he doesn't hesitate to barge into the other fellow's field uninvited. When a purchasing agent honestly confesses to having been impressed by an ad stressing uniformity, he shouts: "Uniform what? What does uniformity promise the reader? Is uniformity unique in this one brand? Does this purchasing agent believe competitive products do not 'undergo rigid checks and inspections'?" He doesn't answer

Continued on page 326



Misuse of The Logarithmic Scale in Charting Business Trends

By LESLIE F. ROBBINS
Purchasing Agent
University of Colorado
Boulder, Colorado

RECENTLY I took occasion to glance through the current issues of a half-dozen of the most widely circulated economic reporting and advisory services to see how many of them use trend charts based on the logarithmic or rate-of-change scale and how many prefer the simple arithmetic scale chart. I found the division to be roughly half and half.

By logarithmic charts is meant the use of semi-logarithmic graphing paper in place of simple arithmetic proportional charts. In the logarithmic chart the values on the vertical axis are measured off as the logarithms of successive numerical values while the values on the horizontal axis are equally spaced to denote equal periods of elapsed time.

The Logarithmic Scale

A critical analysis of the functions of the logarithmic scale leaves a considerable doubt in my mind as to the legitimacy of its use in most of the business chart applications in which it was being used. A trend chart is intended to be a visual aid device. It should illustrate geographically for quick and easy assimilation the general content of a series of data which, if it were only available in the form of a table of statistics, would require a laborious mental process of translation into time and volume inter-relationships. By a trend chart the record of the facts of past performance is graphically portrayed, presumably to af-ford a basis for projecting the probable trend into the future.

The purported reason for using a logarithmic chart instead of an arithmetic chart for charting some of the trends in business statistics is to show graphically the *rate* of the change. This ratio or rate-of-change trend line may be obtained either by plotting the points directly on a logarithmic chart ac-



cording to the series of values or index numbers from the record of the trend being charted, or by computing the percent (rate) of change of each figure from the preceding figure in the series and plotting this percent of change successively to the indicated points of a simple arithmetic chart. Naturally the use of ready prepared logarithmic scale graph paper is the easier of the two.

R. C. Shook, in his paper on the Construction and Use of Charts in Business, published in pamphlet form by the National Association of Purchasing Agents in 1937, points out some of the limitations of the logarithmic scale, and there are other vagaries which he did not mention.

Rate or Amount of Change?

Keep in mind that the rate of the change is the ratio of the amount of the change to the value at the beginning of the period in which the change occurred. The only possible legitimate reason for using this rate-of-change scale rather than the sim-

ple arithmetic scale for charting business trends is to provide graphic representation to those changes wherein the principal significance is in the *rate* rather than in the specific amount of the change.

In this usage a ten point rise in an up-trend from point 25 to point 35 within a certain period when the trend is beginning to develop may be just as significant as a rise of 100 points from point 250 to point 350 in a period of equal length near the top of the cycle. As charted on the logarithmic scale chart these two changes would be presented by trend lines with slopes or pitches of exactly the same degree.

On the conventional arithmetic scale chart such two changes would be represented by trend lines that differ in slope or pitch approximately in the ratio of one to ten. The arithmetic chart scale would tremendously distort the relative significance of the two sets of data when considered as ratios or rates of change. On the other hand, the logarithmic scale chart tends to dis-

When graphic methods of presenting data result in a misleading picture, the whole function of graphic presentation is lost

Charting methods must be related to the type of information under consideration

*

tort the picture if the trend is not one in which the rate of the change is the significant aspect.

A set of data which indicates a constant rate of increase will, when charted on a logarithmic scale chart. give a straight line curve and thus a constant degree of slope. The same data when charted on an arithmetic scale chart will result in a curve with a constantly increasing degree of slope. Conversely, a set of data which indicates a constant amount of increase which would on an arithmetic scale chart give a straight line curve will, on the logarithmic scale chart, show a curve which constantly approaches but never reaches a parallel to the horizontal axis.

It seems to me that the observed use of the logarithmic chart in the current practice of charting some business trends is abortive in that (1) the rate-of-change or ratio scale is not adapted to the basic nature of the particular elements which were being charted, and (2) no trend which changes direction from an up-trend to a down-trend or vice versa can be correctly shown on a logarithmic scale chart by a simple direct plotting of the values to the indicated points. Rate-ofchange charting is applicable to one consistent trend in one direction only. The somewhat prevalent practice of using logarithmic charts to chart trends that proceed sometimes upward and at other times downward, in the same way that an arithmetic chart is used, plotting directly from the record data to the points on the chart regardless of direction changes, can not avoid giving a false representation to the rate of the change.

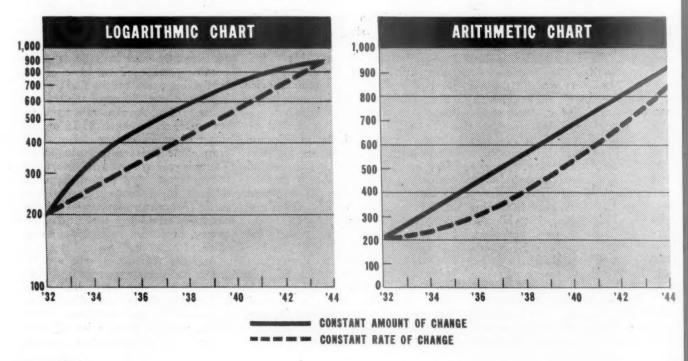
For instance, it is clear that a change in the trend amounting to 100 points on the scale in a given period, from point 200 to point 300

is an increase at the rate of 50 percent, but a change downward in that same trend line from point 300 to point 200 while it is a decrease of those same 100 points is at the entirely different rate of 331/3 per-As plotted directly on the cent. logarithmic scale chart by several of these business reporting services, the two very different rates of change would be represented by trend lines of exactly the same degree of pitch, only in different directions. If we understand that the only value of the ratio or rate-ofchange chart is to show graphically the rate of the change rather than the amount of the change we must acknowledge that the logarithmic scale chart is unable to do so correctly except where the main direction of the trend does not change.

Proper and Improper Uses

Commodities or securities price trends, simple volume of production trends, index of general business, average yield of securities. sales volume, current inventories and the like, all of which were found charted on rate-of-change logarithmic charts, seem to me to have no characteristic which would justify the use of that type of chart. In using it, part of the significance of the actual amount of the change was lost through the modifying effect of the logarithms. The picture was distorted. Such simple progression of changing values requires only a simple trend line on an arithmetic scale chart, after the indicated adjustment or weighting, in order to correctly portray the trend.

Constant rate of change:			
	100		
	110		
	121		
	133.1		
	146.41		
	161.051		
	177.1561		
	194.87171		
	214.358881		
		100 110 121 133.1 146.41 161,051 177.1561	



Probably the legitimate uses of the rate-of-change logarithmic scale in charting business trends is confined to such demonstrations as (1) illustrating the percent of capital gain as stocks rise in value, (2) comparing two or more sets of trend data which occur in different ranges of value change, and (3) charting the trend of any economic element which by nature might be expected to undergo or to parallel organic growth or progression. By "organic growth" is meant such growth as the normal increase in population of a normally growing community. Organic growth lies somewhere between arithmetic progression and geometric progression. The process of constructing a brick wall will illustrate arithmetic progression under the ministrations of one steady bricklayer, but the number of rabbits in McGregor's field will undergo organic growth if McGregor and his dog leave the rabbits to their own devices.

It is not easy to justify the use of the logarithmic chart in any condition of declining values because it is difficult to conceive of organic growth in reverse. That condition might be encountered in such a hypothetical factor as progressive obsolescence, or it might be found in the factor of life expectancy of a group of middle-aged people. The normal expectancy of death accelerates with the average age of the group. But such factors are not often the subject of business survey or advisory service charts.

No Zero Point

Another disadvantage in the use of the rate-of-change chart is the difficulty of locating values between the cardinal points on the logarithmic scale. The intermediate points between the lines are not easy to plot or to interpret without the use of a supplementary guide. For instance, point 45 lies at a spot somewhat above the half-way mark between point 40 and point 50. This may be illustrated by citing the similar harmonic rate-of-change scale: The distance between point 40 and point 45 may be thought of as the sum of 1/41 plus 1/42 plus 1/43 plus 1/44 plus 1/45, while the distance between point 45 and point 50 would be 1/46 plus 1/47 plus 1/48 plus 1/49 plus 1/50.

A further drawback to the use of the rate-of-change chart is that the lowest value which can be represented must be some value greater than zero. Minus values are not possible, and zero is not possible, since

the logarithm of zero is infinity. Now zero values and negative values are sometimes encountered in business statistics and one of the rate-of-change charts to be found in current use showed what went for zero value and crossed over into minus values! How this startling effect was achieved is not clear.

The trend of some business element might conceivably increase by 100 percent or 150 percent or 200 percent or any other practicable rate. A decrease of 100 percent, however, would bring the trend line down to zero from any and all points on the chart. But zero is unattainable on a logarithmic chart. While zero is not likely to be encountered on a price trend—since that would indicate a give-away price, in the matter of volume of production a 100 percent drop to zero would indicate a shutdown, which occasionally does happen.

A psychological disadvantage of the rate-of-change chart is found in the inclination to associate the degree of the slope or pitch with the percent of the change. Thus one thinks of a 100 percent upward pitch (45 degree slope) as a 100 percent rate of increase, etc. As a matter of fact, there is no rate-of-change scale, logarithmic or otherwise, which when adjusted to give an accurate pictorial value to one rate of change, will carry corresponding pitch values to other rates of change in the same trend. The casual impressions formed from the use of the chart are thus likely to be false and misleading.

The logarithmic scale is used by mathematicians for straightening out a consistent rate-of-change curve and for other theoretical and abstract manipulations, but for business forecasters and analysts to try to appropriate it to depict trends in fluctuating business factors appeals to this layman as very much out of place. I shall be suspicious of all trend lines I find traipsing back and forth across the tricky lines of a rate-of-change chart.

HIGH FINANCE in the Admiralty Islands



Buying and selling are off on a spree and value is whatever you can get

By BEN CASSELL

THERE is no price control in the Admiralty Islands. There is such an overabundance of cash among the sailors of the US Navy that price inflation has set in to the extent of one article jumping in price from \$2.50 to \$162.50 after it had passed through four hands.

In one case a sailor picked up three "Catseye" shells for 75c and resold them to a tentmate the next day for \$2.50 each. The second sailor cemented them to a bracelet he had made out of monel metal and sold it back to the first sailor for \$75. The first sailor quickly found someone to buy the trinket for \$162.50.

One man bought a Nicaraguan coin worth fifty cents for \$5. He was very much surprised to learn that Nicaragua was in Central America. He thought that it was some nearby island in the South Pacific. But, after learning the truth,

he was positive he could pull the same trick that had been pulled on him and get \$10 for the coin.

One local trader sent home \$2,000 over and above his pay in the last four months and says he is small potatoes compared to some of the really big operators in the trading business there. Some of the trading is very sharp. An Australian pound, for instance, is worth \$3.25 on the international exchange. But in a crap game it is only worth \$3.00. There is one man who specializes in fading these pound bets. If he wins, he puts them away and continues using American money. After he has collected a lot of this Australian money, he trades it in at a finance office at a profit.

And the Americans, who are internationally known as very easy to sell to, are not the only gullible ones in the world. The Australians were fascinated by the American silver dollar, paid \$2.50 each for all they

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Purchasing Is A Major Responsibility

Purchasing Agent Must Take Active Interest in Material and Production Problems — Know-How and Know-What are Indispensable When Spending Your Company's Money.

Do Not Take Anything for Granted.

By W. J. ROEMER
Purchasing Agent
The Bristol Company
Waterbury, Conn.

F IVE years ago, the executive management of The Bristol Company became acutely aware that there was drastic need for reorganization of its procurement methods and policies. The purchasing department was such in name only. On the agenda of practices that needed correction were such things as lack of uniformity in the placement of orders, haphazard letting of contracts, conflicts with various regulations governing state and interstate traffic, loss of discount, and inordinate material costs.

Further, akin to the practice of many other industrial plants, buying in many instances was very "close"—that is, placement of purchase orders was not scheduled in line with production requirements. Now we have that excellent term "lead time". The result was costly delays in some cases—machines were idle, men were idle, and production schedules were thrown out of kilter for material either was not on hand when it was needed, or supplies ran short before a job was completed.

This sounds like a rather undesirable situation. It was. Some sixty department heads, engineers, fore-

men and others were selecting materials on the old rule-of-thumb basis. And they were placing orders as they saw fit. Every department head had authority to control an order for materials he wanted.

Room for Improvement

Management became aware of the confusion and actual money losses



directly chargeable to these conditions, and had come to the conclusion that a factual centralized purchasing department would provide the means for eliminating most of the problems and difficulties experienced, and in addition would enable the company to effect money savings of some fifteen to twenty percent.

Conditions were being aggravated by increasing war demands. CMP



W. J. Roemer and lobby display of Bristol literature designed to acquaint salesmen with products and material requirements of The Bristol Company.

(At right) F. W. Frohn, Assistant Purchasing Agent



T. V. Sanford, buyer and expediter, discussing a problem with engineer J. R. Pattee

regulations, allocations, priorities, changing sources of supply, emergency orders, new production, new materials, and other innovations of a wartime economy wrecked old practices, and created consternation among those accustomed to the easygoing of the pre-war era.

The functions of the purchasing department were largely of the rubber stamp variety. Contracts were consummated by the head of a particular department concerned rather than by the Purchasing Agent. If an engineer decided that he needed a certain type of equipment or special parts, he contacted a supplier, sent an engineer to tell the supplier what was wanted and ended up with a special product at an excessive price. It is axiomatic that one supplier plus special products usually means in-

ordinate prices.

Our business is highly technical and, as users of recording instrument equipment well know, involves the use of many special materials and involves precision production. While purchasing of new materials was not actually on a hit or miss basis, it closely approximated that situation from the standpoint of competitive buying. Procurement was largely a matter of following the lines of least resistance.

For instance, formerly it was the feeling among some of the department heads that purchase by sample was the logical means for procuring certain materials. I will admit that it provided the easiest means, especially when dealing with only one supplier, but under no circumstances is it the most economical nor the most dependable. Engineers of the two companies concerned, namely the buyer and the seller, would develop a sample and that was the sole method and course of procurement.

Multiply the complexities that had developed through sixty department heads giving little heed to such things as standardization, competitive buying, possible alternate materials, uniform paper procedure, discounts, etc., and you have a situation that needs changing. That's the way our executives felt.

Some five years ago I received a call from the President of the Company. He said that he wanted to see me about a very important matter. At that time I had been with Bristol for some twenty-two years. The first seventeen years were entirely in sales work. I had been given a pretty free hand, and among other things I built up and managed a service department. Thus I had an intimate acquaintance with all of our products-their function, the materials that went into them, and I knew how they were made. This acquaintanceship with one's own products is quite essential if one is to intelligently and efficiently direct a service department. And the department was keeping me actively occupied when I received the call from the front office.

Introduction to Purchasing

There I learned about management's decision to reorganize the Purchasing Department. Furthermore I was told of the many problems that had developed and the unsatisfactory conditions that existed. And then I was told that I had been selected to head that department. The ensuing discussion is mere detail. Department heads were notified that as of such and such a date, all procurement regardless of nature or amount, would be under the jurisdiction of the Purchasing Department.

Now, a new man starting on a new position sees many things that he feels might be desirable to change. Many of my convictions about procurement have been confirmed; others have been discarded. Nevertheless, I have arrived at certain conclusions, and one of these is that the Purchasing Agent can render an invaluable service to his company, if he uses initiative and is aggressive as well as progressive. It means a lot of hard work. However, it isn't hard work if you like it, and see your efforts resolve into effective results, and especially if you see rule and order coming out of chaos.

Among all the lessons I have learned, I feel that the most important is that the Purchasing Agent should take nothing for granted. This necessitates that he have an

intimate acquaintance with his company's products, the materials used in their fabrication, the processes employed, and the end uses of those products. Furthermore, he of necessity must be quite well acquainted with the suppliers with whom he is dealing, not merely from the standpoint of dependability, but their production facilities, and the many other factors that enter into efficient procurement.

Abrasi

Acids

Alumin

Shee

Rod

Tube

Bags (

Bakelit

She

Rod

Tub

Balls

Barrel

Bearin

Bells

Bellow

Belts

Bottle:

Boxes

Brass

She

Roc

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Tub

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Bubbl

Bulbs

Bulls-

Cabir

Cable

Cans

Caps

Carb

Carto

Casti

Cells

Chair

Chen

Circle

Clam

Clea

Clips

Clock

Cloth

Cluto

Coils

Com

CI

Tu

Com

Conr

Conr

GI

Die

Sa

Bricks

Bronz

I don't mean the intimate details of production and planning. But, how can a man buy intelligently unless he has some knowledge of these functions. Otherwise the Purchasing Department is but a rubber stamp if the P. A. just "takes things for granted", and is not interested in the benefits to be derived from individual purchasing based on "know how" and "know what".

This means that the Purchasing Agent must take an interest in production problems. No, he doesn't have to work out the details. But, he is spending the company's money, and every order that he places, to a minor or major degree, has a bearing upon the success of the company. And one thing he must have, is complete control over all purchasing. This does not imply a dictatorship. But it does require the closest collaboration with the engineering and the manufacturing departments. It requires close cooperation with the supplier or subcontractor. It calls for the cooperation of all concerned. It is the P.A.'s job to develop this coordination.

Cooperation with Engineers

I am not dictating to the engineers what they should specify. It is my earnest effort to work with them constructively. I may make suggestions because it is my practice to analyze products, materials



The catalog file is carefully cross indexed, and Mr. Roemer insists that it be kept up-to-date

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· A DIVERSIFIED SHOPPING LIST ·

Typical Items of Purchase at the Bristol Company

	Typical Items	of Purchase at the b	Sristol Company	
A	Contacts	Gloves	Mouldings	Slitting
	Contactors	Grinding (Centerless)		Sockets
Abrasives	Copper	Guards	N	Solder
Acids	Beryllium	Gums	Name Plates	Solenoids
Aluminum	Sheet		Nickel	Spacers
Sheet	Rod	Н	Rod	Springs (All kinds)
Rod	Tube		Sheet	Sprockets
Tube	Wire	Hardware	Silver	Steel Fabricated Parts
В	Cord	Holders	Tube	Steel
D	Cores	Hooks	Nozzles	Belt plate
Bags (All kinds)	Corks	Hose	inozzies	Belt lacing
Bakelite	Counters	1	P	Cold rolled
Sheet	Coomers	1	- " .	Hot rolled
Rod	D	Instruments	Padlocks	
Tube		Fabricator	Paper	Machine
Balls	Dampeners	Industrial	Pilots	Springs
Barrels	Decalcomania	Insulation	Pins	Stainless
Bearings	Dials	Insulators	Pipe	Tool
Bells	Diaphragms	Iron	Brass	Screw stock
Bellows	Discs	Angle	Iron	Tube
Belts	Drives	Channel	Steel	Wire
Bottles	Chart	Rod	Lead	Stones
Boxes (All kinds)		Wire	Plastic	Stoppers
	E	Soldering	Moulding	Strainers
Brass		Boiler	Rod	Swaging
Sheet	Electrical Apparatus	Boller	Tubing	Switches
Rod	Electrodes	J	Sheet	-
Tube	Electrotypes		Plating Supplies	Т
Bricks	Engravings	Jacks	Platinum	Tags
Bronze	Envelopes (All kinds)	Jewels	Plumbing Supplies	Tanks
Sheet	Everdur	Joints '	Plugs	
Rod	Rod	Jugs	Points	Tape
Tube	Tube	-	Pointers	Terminals
Brushes (All kinds)	Excelsior	K	Posts	Thermocouples
Bubblers	Eyelets	Keys	Prints	Timers
Bulbs		Knobs	Printing	Tin
Bulls-eyes	F	Knobs	Protectors	Tools
С	Emstanana	L	Pulleys	Machine
C	Fasteners		Folleys	Small
Cabinets	Felt	Labels	R	Transmitters
Cable	Ferrules	Lamps		Treating (Heat)
Cans	Filaments	Lead	Rectifiers	Tube
Caps	Filters	Pig	Regulators	Metal
Carbons	Finishes	Sheet	Relays	Trumpet
Cartons	Fixtures	Tube	Reservoirs	.,
Castings	Flanges	Lens	Rings	V
Die	Floats	Levers	Rivets	Valves
Sand	Flux	Links	Rod	Valves
Cells	Forgings	Locks	Drill	valles
Chains	Frames	Loops	Invar	W
Chemicals	Fuses	Lubricant	Pinion	
Circles		Lugs		Washers (All kinds)
Glass	G	Lumber	S	Webbing
	Galvanometers		Scales	Wicks
Clamps	Gas	M	Screws	Wire
		Mashines		Nichrome
Clips	Acetylene	Machines	Сар	Rivet
Clocks	Hydrogen	Office	Set	Thermocouple
Cloth	Nitrogen	Factory	Wood	Wood
Clutches	Oxygen	Magnets	Setters	Wool
Coils	Propane	Magnetos	Shunts	
Compounds	Gaskets	Manometers	Silica	Υ
Cleaning	Gears	Mercury	Silver	Veren
Tube	Glass	Monel	Rod	Yarn
Compressors	Window	Rod	Sheet	Z
Connections	Eye	Tube	Tube	
Connectors	Tube	Motors (All kinds)	Sleeves	Zinc
	1000	moiors (rui minus)	0.00.00	

INC



General view of the Purchasing Department. "Open Order Trays" are shown beside the desks



In writing purchase orders, the Wheeldex file of suppliers' addresses is a time-saver

and processes carefully. I feel that our technical men have their hands full. Maybe they have not had time to investigate the new things that are constantly coming on the market. And in the event I feel that possible improvements or lower costs might be developed, I get my facts together and present them, so that they may analyze what I have uncovered.

In the early days of the transition from former practices to centralized buying, there apparently was some resentment on the part of a few who did not get the true picture of the beneficial results of uniform procedure and intelligently developed competition. But the picture is now quite harmonious, for our department heads realize that they do not have the time to investigate materials and suppliers, study government regulations, laws, markets, combination lots, special lots and the other factors that make for efficiency in procurement.

Furthermore, we in the Purchasing Department encourage our engineering and production men to visit suppliers, and talk to salesmen. The only request we make is that

we be privileged to sit in on these meetings, because it is necessary that we also know of new materials and processes. Frequently I go with our engineers when they are working on some intricate development.

In connection with the prime rule not to take anything for granted, I make it a point to carefully analyze the items that we purchase. That was my big job when I took over. It still is a big job and will always be a big job because we buy some 30,000 different items. Every day I select a dozen requisitions which I analyze from the standpoint of their use in our own products or in our production processes. Then through intimate discussions with the salesmen that call and personal visits to the suppliers, I analyze their claims, and find out how the material is made. Seeing both sides I feel that I am in position to make suggestions that may be of benefit to either the buyer or the supplier, or to both of them. I call this use-analysis. It may seem like a lot of work, but it helps me in my buying, and makes me of greater service to our departments and to the company itself.

Know Your Suppliers

An important part of this picture is the matter of profit for the supplier. I do not want any supplier to sell me anything at a loss. We want dependable suppliers—suppliers who know our products, and how their materials are used. They can best serve us and are interested in serving us when they can make a fair profit on our purchases. And I can assure you that having a knowledge of materials and values, and production, is of prime importance in establishing satisfactory relations with dependable suppliers.

Furthermore, I like to contact salesmen personally whenever, possible. They can do their "selling" first or last. I usually invite them to tell me what is on their mind. And then I take up matters that are on my mind. Maybe a salesman represents one of our suppliers. This gives me the opportunity to take up matters about which there may be a question. I enlist their support in getting things settled, orders cleaned up, or an answer to an inquiry. In other words, I try to make time spent with salesmen, worthwhile. If I find that a salesman is not really familiar with our line of products, Invite him to take a supply of our literature for study, so that he will be better able to tell me how his products might meet our requirements, the next time he calls. Yes,

this is time well spent from various angles.

I feel that every Purchasing Agent has countless opportunities to be of service to his company by making it a point to know all about the products that he purchaseshow they are made, production time, and so on. For instance we recently developed plans for \$50,000 worth of die castings and \$25,000 worth of The complete program of new design was discussed by the Chief Engineer and the Purchasing Agent, and the program was so arranged that when designs were completed, preliminary blue prints were delivered to the purchasing department. Emphasis was placed upon the fact that the Purchasing Department could be of tremendous help in the procurement of the castings and tools if we went right along with it from the beginning.

With the design engineer I visited about five die casting plants. We learned about their equipment and their methods, and discussed with their engineers such matters as design and production. Some changes were made in the design—not by the Purchasing Agent, but by the engineers. The result was that I acquired a pretty good understanding of what the job involved, and what suppliers could best handle it, and I know who should get the order when it is placed.

Importance of Specifications

Some engineering departments will design an item and submit a requisition reading "Buy from So and So," and there are some purchasing agents who will say "let the engineers handle it." What kind of a purchasing job is that? It's just a synthetic purchasing job further emphasized by a synthetic rubber stamp. My feeling is that many department heads overlook that the purchasing department can be of real service to them and save money for the company, for there is a "know how" to purchasing that few department heads have acquired.

Some time ago we saved a great deal of money—thousands of dollars—on a certain job by substituting specifications and competition for the "sample" method usually followed in buying a certain product, a cuprous alloy wire. By creating standard specifications for this wire it was possible to place our requirement before several dependable suppliers, with amazing results from the standpoint of a better price. But more important than the money saving was the fact that we were able

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to materially help in expediting the landing craft program by getting the material in much shorter time than usual because of standardizing it rather than buying by the sample

and one-supplier process.

In another case a certain department had gone over the head of the Purchasing Department with a specification job prepared jointly by our engineers and the Navy Depart-When it was learned that ment. the job was about to be let, we insisted upon having the specifications so that we might do a real "purchasing job." Ten suppliers were contacted, and it finally ended up by giving the job to two suppliers who demonstrated that they could not only do a better and quicker job, but it was done at a saving that ran into many thousands of dollars. In other words the job was put under purchasing control where it belonged.

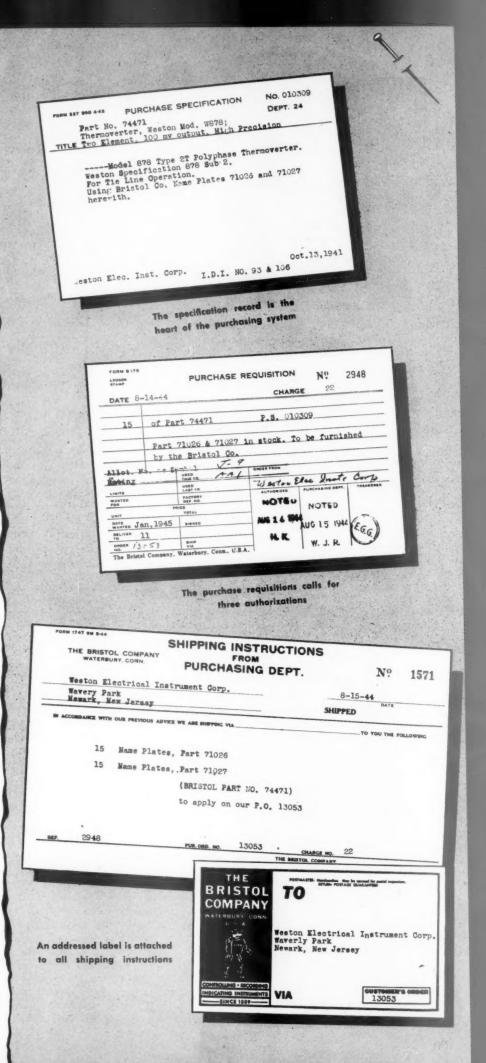
Purchasing Agents have a big responsibility and a big opportunity. They can belittle both by getting the same pleasure from a rubber stamp that our East Coast air wardens got out of their plastic whistles.

On the other hand, they can adopt what some persons may think is the hard way-studying materials, production processes, and uses of their company's products, and keeping abreast of the extremely new and different materials and products born of the war effort. Thus they acquire the real "know how" that makes for efficient procurement, and builds prestige and respect for the purchasing function.

Purchasing Procedure

Purchasing Agents should analyze their job; they should be familiar with company policies; and they should form a definite plan of the things they want to accom-They should decide on a sound program and go to work on it. It is a matter of knowing your job and making it work. They may find that they will learn more by some of their mistakes, than by things achieved. But to plan is to have a goal and a way to reach it.

In reorganizing our Purchasing Department, I have deemed it advisable to do a complete job-from equipment to policies and paper procedure. We are constantly changing our routine and forms as more efficient methods suggest themselves. In this effort we have the cooperation of all of the members of the organization including the engineering, production departments, management and others.



ING



The purchase history file has capacity for 10,000 cards, arranged alphabetically by purchased items

Here is a brief description of the paper procedure and routine we are now following, with reproduction of the principal forms mentioned.

When a requisition is received from the Production Department or other department authorized to issue them, it is immediately referred to the Priority Department for noting allocation and symbols. It is then returned to the Purchasing Department where it is checked against what we term our Post Index record for data as to supplier, cost, buying programs, and so on. requisition is then checked and approved by me and then by the company treasurer, following which it is checked against priority ratings, WPB limitation orders and other regulations by our assistant purchasing agent. Thence it is passed on to the typing department for conversion into a purchase order. After being checked against the requisition and specifications, the purchase order is then passed in to me for my personal signature. It is not rubber-stamped.

As explained later in the general description of our Purchase Order Form and its routine, copy of the purchase order is immediately delivered to the person in charge of our expediting, who follows the order closely by letter or telegram or telephone, according to the merits of the case.

Acknowledgments are recorded daily on our office copy together with suppliers order number, price (if any), and promise date. Acknowledgments with price information are kept in file. Promise dates are noted on a 3 x 5 card under the day of the month, and this card is sent to the Receiving Room daily for checking. If the material has

been received it is crossed off. If it has not been received, the matter is referred to expeditor for further handling.

The production department carefully checks on orders, and alerts the Purchasing Department with a "Follow Up" slip for materials that are short. These follow-up slips are checked against records on our copy of the purchase order. If there is no information as to supplier's promise of shipment, a follow-up letter is sent, the file is turned over to the expeditor, and pressure is applied for the quickest delivery possible of the material ordered.

The Order Form

I do not know that there is anything out of the ordinary about our purchase order form. It consists of five copies which are distributed as follows:

The first copy is sent to the sup-

The second copy is the Purchasing Department copy. It is kept on open file until the order is completed. Orders are filed alphabetically and then numerically in what we call the "Open Order Tray." This is really a small portable cabinet which is readily moved from desk to desk or different departments in the office as required. Formerly these records were kept in binders, and there was more or less confusion and delay incident to eight buyers and clerks wanting to use certain of the files simultaneously. The "Open Orders Trays' have eliminated a great deal of unnecessary work, and have proved highly efficient.

All letters, written acknowledgments of orders, customers order number, telegrams, prices, debits, memos, shipping memos, credits, partial receiving slips and final receiving slips are entered on the back of the Purchasing Department copy.

A running balance of material is also kept so that we at all times know what is due on each order. The office copy provides a complete record of all transactions and constitutes our permanent record.

Receiving slips as received are first entered on the order and then clipped to it. Upon receipt of invoice, the information is checked against our post-index record, after which the invoice is sent to the accounting department, and the receiving slip is filed with the Purchasing Department file copy. In event of changes in price, up or down, invoice is returned to supplier, letter record noted on our file copy, and

the file is held in the "open file" until the question is settled.

The third copy is the receiving department copy. This department retains the copy until the material is received. If only part of the order is received a "partial receiving slip" is made out. This is a numbered form of unusual interest. It is described in detail later. The "partial" number and date are entered on the receiving copy, so that the receiving clerk knows at all times the exact status of the order.

The receiving copy of the purchase order form is a two-part form, the upper section being indicated by perforated line for easy detachment. and each section bears the Purchase Order number. The upper part or heading carried the supplier's name and the order number. This part is sent to the Purchasing Department as soon as the material is received on a completed order, and the information is recorded on the purchasing department copy in space provided therefor.

The second half (lower part) of the receiving copy bears the order number, shows material purchased and the routing of the order. This part is sent to the inspection department with the goods. After passing inspection the material is sent to the factory. The same procedure applies to the partial receiving

copies.

A Time Saver

The fourth copy also consists of two parts. The top part is held in the purchasing department and is filed numerically in a small box file. When material has been received and invoice passed for payment, these headings are removed from the file. The bottom part of the fourth copy is sent to the receiving clerk with the receiving slip. When order is complete, this slip is sent immediately to the production office as a notification of receipt. This method saves a great deal of time, for it makes it unnecessary for "Production" to check with Purchasing or Receiving as to what materials are received.

The fifth copy is the expeditor's copy. It is held in the Purchasing Department and is used primarily by expeditors when calling on out of town suppliers. Pertinent information on the office copy is transferred to the expeditor's copy for reference, and as a guide to action

to be taken.

Our purchase order form and its four copies are printed on white paper copies tical 1 dle-y partme purcha delive pedito

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paper stock, the 3rd, 4th and 5th copies being imprinted with a vertical 1½" color strip across the middle—yellow indicating receiving department copy, pink indicating the purchasing department material-delivery copy, and blue, the expeditor's copy.

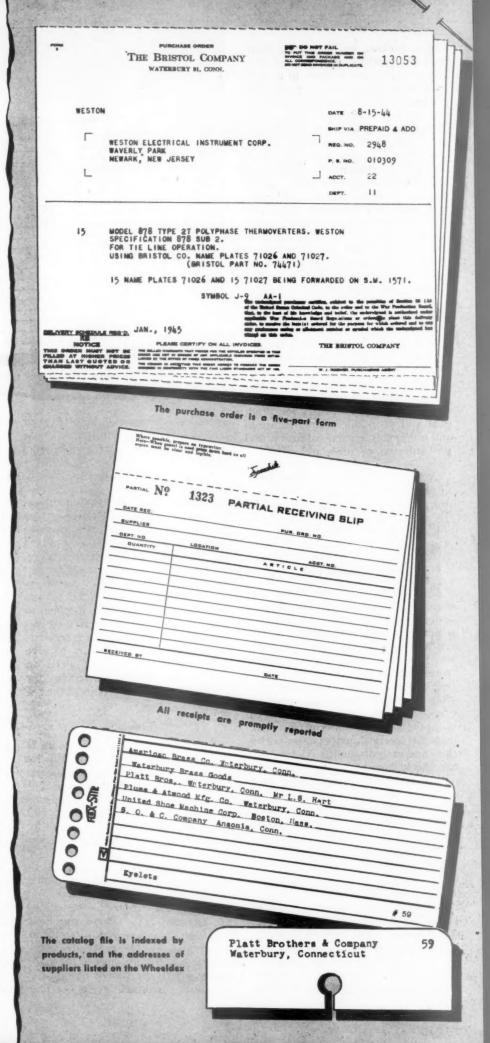
Partial Receiving Slip

Mention was made of our "Par-tial Receiving Slip." This is an interesting form, for it is what might be termed a two-in-one form. is unique in that the format has enabled us to materially reduce the cost of this manifold form by the elimination of two carbon sheets, and making two carbon sheets serve for two writings. Though this numbered form is used in sets of three, each pad consists of six pages, alternating in overall size as follows- $4\frac{3}{4} \times 6$, and $5\frac{1}{2} \times 6$ inches. One carbon lies between the 2nd and 3rd sheets, and the other is between the 4th and 5th sheets. Each pad includes two serial numbers. These numbers are alternated with the different size sheets. After the first writing, the three long sheets are removed from the form, the short sheets and two carbons then being ready for use. If you will make up a form as above outlined, you can easily judge the simplicity of this two-in-one form, and may see a way to save money on some of your simple manifold one-time carbon forms.

Specification Record

One of our efficient tools is our Purchase Specification record, which is maintained on 4 x 6 cards. It marks our complete divorcement from former practices and buying by sample. These specifications have been developed through the cooperation of engineering, production, specification writers, and purchasing departments. As is apparent, their use affects not only buying, but design, operation, production, and maintenance. Necessarily under present conditions many of these specifications represent Army-Navy standards, as well as standards adopted by engineering societies and the National Bureau of Standards, and those developed by our own technical departments. It has been the endeavor in preparing these standards, to avoid any factors that would restrict open competition among reputable suppliers.

We now have 10,000 cards in our Purchase Specification file, and expect in due course to have an approved Purchase Specification for a



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major portion of the parts, materials and products that we buy. Purchase orders are written in accordance with these specifications. The information on the cards is not restricted to specification data. In addition, the cards carry information on prices and economical buying quantities. For instance, 100 pieces of a certain item might cost \$16.00, and 200 pieces but \$22.00. Again, dies for a short run of 1,000 parts may make for unusually high unit costs, and in the case of stock items, it would be to our advantage to order even 5,000 to 10,000 even though the immediate need were for but a few hundred.

Also, the card carries notations indicating special points that must be watched by the inspectors upon receipt of material. This information is typed on the receiving department copy of the purchase order.

The benefits of a Purchase Specification system are far reaching. Such a system is the key to quality control; it opens the way for practical and profitable standardization, and eliminates errors, confusion and the ordering of sub-standard materials.

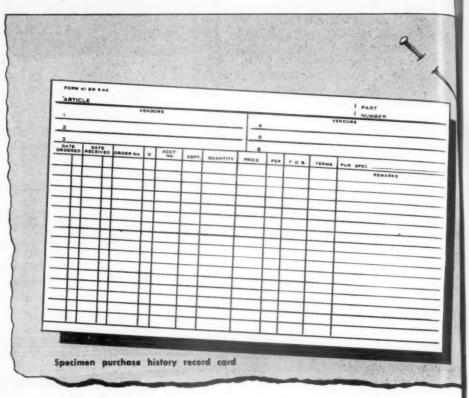
As requisitions for material come through, the Purchasing Specification cards are removed from the file, attached thereto, and the specification data is typed on the purchase orders.

History Record Card

Our history record cards are maintained in a Postindex cabinet. and filed alphabetically by name of material or article purchased. When an order is issued entry is made on the card with the supplier's name, date of the order, order number, quantity ordered, material purchased, and the purchase specification number. Invoices are entered with the date of material received. quantity received, prices, transportation, and cash discounts. All invoices are checked with the previous price, and if the price varies, the matter is taken up with the supplier to learn the reason for price increases. Record of substitute materials is also noted on the card, so that we know just what type of material has been received.

Product List

As previously mentioned, The Bristol Company utilizes some 30,000 different parts and materials in its manufacture. We have prepared an abridged list of these products, classifying them where possible under general heads. This list has



proved of immense help to our buyers and others for it is a ready guide to our material and product needs.

It is our plan to have copies available for the salesmen who call on us. As purchasing agents well know, too many salesmen are making "get acquainted" calls, and many of them have no conception of the products we make, the materials we require, or how or why their materials may be of interest to us. They are wasting their time, their company's time and our time. We will invite them to study this list and then if they feel that there is basis for an interview. we will be only too happy to give them all the time they need to present their story, and arrange for a meeting with our technical men if necessary.

Catalogs

Another of our valuable tools is our catalog file. It is used daily by our buyers and by our engineers. designers and production men, and by me. In this file we keep the upto-date copies of more than 500 catalogs in alphabetical order by company name. In conjunction with this file we have a product numbering system in which products are numbered individually or under general classification. Eyelets, for instance, come under the classification number 59. These numbers have been cross-indexed on a visible record and Wheeldex ready-reference record. No. 59 sheet in the visible record shows the names of six companies making eyelets. The Wheeldex record is by company name, and carries the numbers of the various products made by that company that we are interested in.

Requisition Form

The requisition form was developed by the Purchasing Department. It is 4 x 6 inches in size, and as will be noted calls for three approvals before purchase order is made, in the three sections in the lower right hand corner under the headings "Authorized", "Purchasing Agent", and "Treasurer." The space carrying the indication "Order Form" is reserved for the exclusive use of the Purchasing Department.

Conclusion

The Purchasing Department of The Bristol Company is made up as follows: The Purchasing, and one Assistant Purchasing Agent, W. J. Frohn; one buyer and expediter, T. V. Stanford; a chief clerk who acts as supervisor for the Purchasing Department; two stenographersecretaries, invoice clerk, posting and invoice clerk, order-writer, file clerk, and receptionist, and receiving clerk and two assistants. Through this organization some 1500 purchase orders are handled monthly.

In writing this article it has been the intent to emphasize some of the basic principles which make for effective collaboration between the "Big Four"—Management, Engineering, Manufacturing and Purchasing, create pleasant relationships and assure efficient procurement.

WHEN YOU BUY

Plastics

Effective procurement begins with an understanding of the plastics industry as well as of the materials themselves

An interview with CHRIS, J. GROOS Boonton Molding Company

By GEORGE E. HENRY

FFICIENT plastics procurement demands an understanding of the plastics industry and its products, declares Chris. J. Groos, sales manager of the Boonton Molding Co., Boonton, N. J., president of the Plastics Engineers Association, and one of the industry's pioneers. The plastics industry is one of the least understood of our modern industries, he said, largely because plastics have made their great technological progress during the past few war years and comparatively few persons are aware of the technical developments that have definitely established plastics as engineering materials within their own rights.

The popular concept of plastics, he continued, is largely born of prewar counter displays and civilian products uses. The public, which includes most business and industrial executives and professional men, has had little or no reason to discriminate between the different kinds of plastics. Phenolic switches on electrical appliances, urea pastel tumblers, colorful cast phenolic ornaments, acetate lampshades, pyroxylin dresser sets, acrylic vases and knobs and handles of varying materials have all been generally accepted as being made of "plastic." This also has been true in large degree so far as what may be termed engineering uses are concerned.

As a matter of fact, it is surprising in view of developments, how few



CHRIS. J. GROOS
Sales Manager
Boonton Molding Company

persons in the industrial world are familiar with the background of the plastics industry and the number of highly specialized divisions that go to make it up, or the varied types of plastics and their unique qualities. It is just as important for the industrial purchasing agent to become acquainted with the 57 and more varieties, so to speak, as it is to know the uses, and use-limitations of the different types of metal that he may be buying.

Wide Variety Available

From the standpoint of variety of products, specialization, and varied end uses of its products, the plastics industry might be compared with the metals industry and its many kinds of iron, steel, copper and brass,

magnesium, aluminum. zinc, lead, and endless assortment of alloys. The character and uses of these metals are well known and few are the industrial purchasing agents who do not have a knowledge of them, their processing, fabrication, costs and an understanding of the metals industry and its makeup.

In the plastics industry we have the phenolics, ureas, melamines, cellulose nitrates and acetates, ethyl cellulose, the vinyls, acrylics, nylon, styrenes, casein, lignin, casting resins and other types including the cold molding plastics. As with metals, these many types of plastics have general and specific use values. Each has its own outstanding field upon which its rivals may encroach but really never threaten its domination. And as in the metals industry, new materials and compounds (alloys) with new uses and new physical values are constantly being introduced.

And now that the industry's technical wizards have evolved plastic uses to a degree where they are permanently established in the realm of engineering materials, it is incumbent upon the Purchasing Agent to be as well acquainted with them as he is with metals and forest products.

Producers and Fabricators

Mr. Groos stressed the need for having an acquaintance with the general make-up of the plastics industry, as an aid in developing suppliers who can make or furnish the products or fabricating materials that may be wanted. Analysis shows that there are about a score of raw material manufacturers who sell their resins and other raw materials to the respective products makers. These include molders, laminators, extru-

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Satisfactory procurement of such parts as these involves selection of the right material and the right fabricator

ders, casters, and a large group bearing the general designation of fabricators; and, these groups are divided again into groups that specialize in certain materials and processes.

Sheets, rods and tubes of the cellulosic materials are produced by the raw material manufacturers and the extruders. Similar products of the phenolic casting resins are made by the companies specializing in resins production or casting. Acrylic sheets, rods and tubes are made by the manufacturers of the acrylic materials. And laminated sheets, rods and tubes are made by the laminators.

There are about 800 companies that come under the broad classification "molders," explained Mr. Groos. Some of them do compression and transfer molding—molding processes used almost exclusively with the thermosetting plastics. Some molders specialize in injection molding which is used exclusively with the thermo-plastic materials. Some of these molders, those handling the thermo-plastics, also do extrusion work, and then there is a small group that specializes in extrusion products. Then there is

that important group, the laminators. There are a few companies that are equipped to do all four of the types of work mentioned, but their number is quite limited. Another group specializes in casting with the phenolic resins.

As contact is made with that division known as the "fabricators," of whom there are approximately 2000, it will be found that some specialize in processing the thermoplastics; some in the thermosetting materials, others in casein; and some who do specialty work in a limited number of materials. New developments in the field which should prove of interest to Purchasing Agents, are low pressure molding, and the introduction of elastomers or rubber-like plastics.

If purchasing agents are to do a good job of plastics products procurement, they of necessity must know where to find the right type of suppliers who are qualified to handle the job a proposal may cover, whether it be molding, extruding, laminating, casting, or fabricating.

Mr. Groos dramatically illustrated this point by stating that at least thirty percent of the inquiries who come into his office are referred to

other types of plastics fabricators, or, if the product under discussion is felt to be unsuited for plastics production, they are so advised. He emphasized that responsible members of the plastics industry will not permit the use of plastics in products for which they are not suited.

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In other words, the mere statement by a manufacturer that he "wants to use plastic" is quite indefinite. The molder must, to render dependable service, know the end use of the product and also analyze design specifications or a model of the proposed product that he may advise as to whether or not it is suitable for plastics production, whether it lends itself to molding as designed, and the type of plastic that should be used. The latter demands careful analysis, for the use of the product may involve physical qualities, electrical qualities, dimensional stability, high temperatures, high relative humidities (or use in water), or some acid or alkali con-The use requirements will dition. dicate the type of plastic to be used, the molding process (if a molding job) and type of mold.

Pitfalls in Design

The design factor also demands careful analysis, for molded parts must be removed from molds and the design must be such as to facili-tate their removal. There are numerous design pitfalls which are not understood by the unitiated. There are at least two dozen major ones such as re-entrance curves or undercuts which are absolutely taboo on small diameters (and costly on big ones), oblique holes, inserts covered by thin layers of material, thin walls adjacent to thick sections, sharp inside corners, holes near edge or face, irregular shaped inserts, and other factors, anyone of which may cause product failure. And of much importance is the factor of tolerance. which will be discussed a little later.



Sometimes the question is raised as to whether molds designed for the thermosetting plastics may be used for the thermoplastic materials. In general, the answer is no. Molds for thermoplastic material are designed for one type of processing, and molds for thermosetting materials are cured by heating. Thermosetting materials cannot be molded, to date, in the thermoplastic presses for the latter are designed for quick automatic cooling.

Molds for thermosetting materials can be used for molding the thermoplastic materials but the process of cooling and extra handling involves very heavy expense. Molds designed for canvas phenolics, for instance, are cumbersome and slow with wood flour phenolics and ureas. Compression molds for the acetate materials are not so good with canvas phenolics—and so on. (Compression molding is sometimes used for large thermoplastic moldings.)

"The logical procedure," declared Dr. Groos, "is for the buyer to pick a professional molder for the job, check his standing, equipment and experience, then sit down with him and analyze your problem. Tell him what you want to do, why you must have certain features of construction, and then accept his advice as to what can or cannot be done."

Importance of Molds

It should be borne in mind that molds are expensive things, costing all the way from a few hundreds to many thousands of dollars, and that it takes from four to twelve weeks to perfect a mold. It cannot be too strongly emphasized that molds are a poor place to try to economize. Cheap molds will wear, creating heavy flash and an unsightly piece. They will spread, ruining dimensions; they will break down and hold up the production line. Also, in the event that you change suppliers it is not likely that a new sup-

plier will accept a second hand mold of poor quality. Buyers will find that a competent molder can be of immeasurable service for he may be able to see ways of making design changes that will make for economical molding and possibly an improved product.

This brings up the matter of tolerances. Mr. Groos states that a fair commercial tolerance parallel to parting line of piece in the mold would be plus or minus .003" per inch of dimension. At right angles to parting line of mold it would be plus .010 minus nothing. These tolerances are only effective on single cavity molds. If multiple cavity molds are used, or if high impact materials are specified these tolerances should be increased at least 50%.

He also points that "tolerances" mark a point where Purchasing Agents may be able to affect very impressive savings in their buying. Many designers, he explained, use a standard tracing for their design and specification work, on which

plus or minus limitations conforming to technical standards for certain types of close tolerance work are indicated.

Naturally, the molder who receives such a specification bases his calculations and mold requirements on the specifications called for on the blue prints. As is well known there are thousands and thousands of articles and components the use of which under no circumstances is contingent upon the fine tolerances indicated on these standard sheets. This is true of plastics products as well as products made of metal, wood, rubber, glass, etc. In other words, it should be understood by buyers that they are paying a stiff premium for parts molded within the fine tolerances that may be indicated on the print. If they would "open them up," says Dr. Groos, they would get a lower unit cost.

Fine tolerances may require that the molder build a gauge to make sure that every part is within the Continued on page 314





INVENTORY CONTROL *

Centralized material policy and administrative control implements a procurement and construction program that involves 2,000,000 different items

in the NAVY

By REAR ADMIRAL JAMES M. IRISH, USN

Assistant Chief of Naval Operations in charge of Navy Inventory Control

THE war in which we are now engaged has been defined in numerous ways-as a Global War, or a War of Distances, or a Mechanized War, or a War in Three Elements -but all of these ideas are incorporated in the broader statement that this is a War of Logistics. The Secretary of the Navy has defined Naval Logistics as the "act or science of the supply and distribution of material and personnel to the right place at the right time in order to support the Fleet adequately in its operation against the Enemy." Inventory Control is that part of Logistics which involves materiel. and is defined as "a system of policies and directives which requires that procurement of materials be based on inventory on hand and on order in conjunction with known estimated requirements, and that resulting surpluses are eliminated." Inventory Control is frequently confused with stock control. but as used in the Navy, the term has a much wider application and different implications. Stock control asks:

(1) What is it?

(2) How much of it is there?

(3) Where is it?

(4) When is it due? Inventory Control asks:

(1) What is required? (2) What have we?

(3) What is on order?

(4) How much do we order?

It will be noted that stock control implies past actions, while Inventory Control determines future actions.

A Problem of Balance

Consideration of the above definitions will show that the Navy's material problems are not basically different from any large industrial concern. While the making of a profit from operations is not a factor in the Navy, the failure to have the



right material in the required amounts at the right place may result in the loss of American lives or in the failure of strategic operations. The Navy, however, operates under conditions which produce problems peculiar to the Navy. Its ships operate in every ocean and under the widest range of climatic conditions. It requires material that covers practically every article manufactured in the United States. The size of the operation and the variety of the types make the Navy one of the biggest procurement, distribution and storage businesses in the world. But big as they are, the Navy's problems are being solved, and Inventory Control is one of the methods of putting the business of the Navy on a sound basis.

The basic objective of the Navy Inventory Control system is to insure a proper balance between the

supply of and the demand for individual items of material or equipment required for the construction, operation and maintenance of the Navy. Attainment of balance de-

 (a) estimates of the elements of demand—expected usage, requirements for authorized opreational stock and for authorized strategic reserve, and

(b) a computation of the elements of supply—stocks on hand and expected receipts.

Adjustment of supply to demand then requires the following steps:

 A control of procurement or of scheduling thereby increasing or decreasing as appropriate, the inflow of material.

(2) The declaration and distribution of local excesses in order to obtain a properly balanced distribution of stock.

(3) The declaration of material as surplus so as to release and to dispose of unneeded or obsolete items.

Every private company or corporation involved in the handling of materials has problems which for their solution require a proper inventory control system. The Navy most closely resembles an organization like General Motors with a central office and a widely distributed group of operating divisions and sales agencies. Yet the principles of Inventory Control apply equally as well to a small organization where a single individual may be responsible for the material operations of the plant. In either case, it is essential for success that requirements be determined and that the inflow of materials, the stock on hand and the disposal of excesses be analyzed, planned and controlled. This is Inventory Control! The analysis of business failures shows that a large majority of such failures grows out of the ineffective handling of materials. Overbuying or dead stock is one of the most frequent causes of bankruptcy, and there is no better way of assuring profit than to have a well thought out and properly working inventory control system.



Navy Undersecretary Ralph A. Bard presents the Legion of Merit award to Admiral Irish

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"For exceptionally meritorious conduct in the performance of outstanding services to the Government of the United States as Supervisor of Shipbuilding at New York and Director of the material procurement effort during a special program of speed production of Navy Destroyer Escorts for 1943. In addition to his successful administration of duties involved in the supervision of design and procurement connected with the Navy's entire current destroyer program and a considerable part of the landing craft project, Rear Admiral Irish, skillfully and with expert technical judgment, directed the design and construction of one important group of urgently needed destroyer escort vessels. By his brilliant administrative ability and untiring efforts, he contributed in large measure to the accomplishment of the tremendous shipbuilding task and to the ultimate success of our armed forces."

The Secretary of the Navy early in 1944 came to the conclusion that the Navy was, in many items of material, in an over-bought position. He therefore directed that an Inventory Control system be developed and made effective. Although the Navy has many problems which are peculiar to itself, the development of the Inventory Control system as a result of the Secretary of the Navy's directive has brought to light certain principles and methods which are applicable in many areas outside of the Naval Service.

The various steps in establishing an Inventory Control system are:

- (1) Set up a central control group under a responsible head with authority to take action.
- (2) Develop and promulgate basic principles for such a system.
- (3) Develop and promulgate

standards of operation based on these principles.

(4) Audit the operations to determine whether standards are being set by field offices.

In carrying out this program, the Secretary of the Navy established the "Navy Inventory Control Office" by an order issued by himself and placed its direction under the Chief of Naval Operations, which is the highest military command in the Navy Department.

This Office proceeded to develop and issue to the Naval service the principles quoted below and their application to civilian industry is readily apparent:

(1) Requirements, which are the basis of Navy's Procurement Program, will be computed in accordance with policies directed or procedures approved by the Chief of Naval Operations.

- (2) Procurement responsibility for any item of material will, where practicable, be assigned to a single Bureau.
- (3) A central control point will be established by each Bureau for each of the various groups or fields of material assigned to its cognizance.
- (4) An accurate physical inventory shall be taken of all Navy-owned materials and the stock records brought into agreement at least once every twelve months.
- (5) Spare parts or material needed to maintain the Navy's equipment will be identified, insofar as is practicable, in terms of its use, rather than in terms of the equipment for which it is needed in order to permit maximum interchangeability.
- (6) Accounting procedures for material should be simplified to the maximum consistent with legal and practicable limitations.
- (7) A uniform code numbering system for materials and an overall Navy Catalog will be developed, based on adequate technical identification by the technical Bureaus.
- (8) Inventory controls will cover all Navy-owned material which can not be considered expended and which is in fact in the Navy supply system, as designated by the Chief of Naval Operations.
- (9) Procurement will be centralized to the same extent as is the control of inventory. Local purchases should be limited to emergencies.
- (10) Perpetual stock records, central stock position reporting, and schedules of physical inventories shall be developed in conformance with such standards as may be set by the Chief of Naval Operations.

How Requirements Arise

Each one of these "principles" requires elaboration and study to make them applicable to the conditions within any one organization. In doing this it is necessary to be realistic so that the standards by which the field operations are to be judged may be practicable. Such a study will bring out many areas where there is a lack of definite information on which to base procurement. In a large organization such as the Navy, duplication of cognizance and

procurement will develop and there the central Inventory Control Group should be prepared to find the best answer and require compliance.

To give some idea of the problems which may be encountered, some of the Navy's difficulties are discussed below. The Requirements for Material in the Navy come from the following sources:

(a) New construction of vessels and airplanes authorized by the Secretary of the Navythis includes steel for hulls,

machinery for propulsion, guns, turrets and armour, auxiliary machinery and all the thousand items of equipment. There are 29 different combatant types, 26 auxiliary types and 28 types of landing craft and an even larger number of small district craft-a total of 150 different types.

(b) Maintenance of the Navysuch as food, clothing, fuel, some 80,000 items of General Stores and more than a million different repair parts for machinery, planes and boats.

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(c) Construction and equipping of advance bases, hospitals, drydocks, warehouses and landing fields.

(d) Repair of battle damage to ships, planes and their equip-

(e) Material for Lend-Lease.

(f) Strategic reserve for unforeseen emergencies in carrying on the War successfully.

In industry the "requirements" for each item procured or carried in stock will come from a variety of sources. These must be determined by management and a form developed so that the procurement personnel have it available.

Authorizing Procurement

For an effective Inventory Control there must be a justification for the procurement of each item. Therefore the originator of each requisiiton must show that in arriving at the amount requested for purchase he has set down the demand for this item under the various headings in the above paragraph. Next he must indicate what he has on hand and how much is on order. By a consideration of these facts he can determine how much must be procured.

For each of the above listed source of demand there must be an authorized amount. It must not be left to the judgment of a subordinate, or to the ideas of a clerk how much to carry as strategic reserveor for maintenance for example. These are matters requiring the best judgment and experience available. By requiring such an analysis to be made, attention is focused on the lack of such information and the required data is developed and furnished to

the procuring desk.

Physical Inventories

Accurate stock records are the foundation of all Inventory Control. No matter how carefully procedures are devised for the maintenance of perpetual stock records, they will over a period of time, become inaccurate and therefore unreliable. For this reason, and in view of the fact that no conclusions are any better than the information on which they are built, regular and complete physical inventories are of paramount importance if inventory control is to be effective.

To take such a count and to correct the stock records is not an easy task. Nor should such an inventory



Drydock and repair operations are important in maintaining a seaworthy Navy



Steel plates of wasteless dimensions represent the first step in multiple ship construction

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of stock be allowed to interfere with the regular receipts and issues of stores. The Navy was faced with this problem when the Inventory Control was initiated in May 1944. It took seven months to do what was described as "an impossible job." In that time a stock of over 2,000,000 different items was counted, valued at over 6½ billion dollars—located in 800 separate stations and depots. The Navy expended four million man-hours to do it and there is no doubt in anyone's mind that it was well worth while.

The essential part of a physical inventory is to insure that all materials are actually counted. In the Navy, where there are such a wide variety of activities, this was an extremely difficult problem and a different procedure had to be developed for the Navy Yards where there is new construction and repair work going on at the same time; for the supply depots where there are huge quantities of stores flowing in and being forwarded to the advanced areas; for ammunition depots, advance bases and air stations.

A system was developed which was called the Area Inventory System, in which the Yards or the buildings were marked off in advance and everything in that area was identified and counted. This required an organization which studied the problem in advance, prepared necessary tags and reports so that the counting of the material would not be duplicated. As rapidly as an area was covered, the stock records were corrected. In this way an astonishing amount of materials which was not known to be on hand was discovered. In one station, for example, they carried 140,000 items. Some 18,000 items which were not known to be on hand were actually located. This condition was due to errors in paper work, to the transfer of personnel and to the rapid growth of the station so that records of receipt had been lost. In some depots or stations the Area Inventory system was impracticable, but it was used in every possible case.

Standard Procedures

Based on the experience of the past year, a Manual of Procedure is being prepared by the Navy which will serve as the basis for repeating the inventory in the coming years. It is necessary that a yearly schedule of taking inventory be established so that in all depots the same items are counted at the same time.

Each station must in turn make up its work schedule, prepare the necessary forms and tags, divide the station into areas and work to that schedule. Upon completion of an inventory for a given item, the stock records must be reconciled promptly with the physical count.

In order to provide additional checks on the accuracy of the records, it is necessary that a spot inventory of an item shall be made whenever the records indicate that it is exhausted or whenever a credit balance shows on the stock record. In every depot and station of any size it is necessary that a special group shall be designated for the taking of the inventory and the man-hours expended will be reduced as this group increases its experience and technique.

In each Bureau a special organization under a competent officer has been established to see that the Inventory Control policies and procedures within that Bureau are be-

Continued on page 304



Accurate inventory control aids in efficient procurement program



Today, a maze of cranes and scaffolding; tomorrow, another unit in our powerful two-ocean fleet

Training for Contract Termination and Settlement

By FREDERICK T. STEINER
Chief, Training Division
Office of Contract Settlement
Washington

N the words of Under Secretary of War Robert P. Patterson, "in importance to the economic welfare of the nation, the settlement of terminated war contracts is second only to war procurement." Following this thought the Contract Settlement Advisory Board's Committee on Training and the Training Division of the Office of Contract Settlement have been occupied with the problem of long term planning for the training of all war contractors, both primes and subs, large and small. Out of this planning has come uniformity and procedures to be used throughout the country in the establishment of training programs. The "Contract Settlement Training Guide" recently issued to all procurement agencies sets forth policies to be followed in all training.

In wartime, contracts are terminated either: (a) to shift the producer from one type of article, now considered obsolete, to another type of military production, made necessary by changes in tactical requirements; or (b) to wind up production when ouptut is no longer needed. In the first case adjustments may be relatively simple; in the second case, contractors are brought face to face with the harshest realities of contract settlement. Contract termination is the first door that opens on the post-war world. In post-war or V-day contract termination, the war contractor is pretty much on his own.

Be Prepared

When V-day arrives the speed with which companies, both large and small, are able to convert to civilian production may mean the difference between life and death for many business organizations. The subcontractor in any tier must know what to do, he must know what his



Before coming to his present assignment, Mr. Steiner was Chairman of the Interagency Committee for Termination Training at the Wharton School, University of Pennsylvania

superior subcontractor expects of him in the way of information and help and that superior subcontractor must know what the prime contractor and the government procurement agency will require.

Contractors must take aggresive action to protect their rights, avoid delays and assure speedy and equitable settlements when contracts are terminated. Since contract termination touches every department of an organization, and reaches the very heart of production, it is vitally important that personnel be trained to handle all phases of the settlement problem. Closest cooperation of all personnel in all parts of an organization is necessary if the contract settlement problem is to be handled with speed and finality. Contract settlement is not a problem peculiar to any part of a contractor organization. It affects all departments and therefore, engineering, purchasing, accounting, legal and personnel departments must be trained in the entire procedures in order successfully to cooperate with each other in the solution of problems encountered

leading up to the final settlement.

The Training Division of the Office of Contract Settlement is interested: first of all, in giving assistance in the establishment of training programs which will benefit all contractors, from the largest prime contractor, to the very smallest lower tier subcontractor; and secondly, in maintaining uniformity in the training programs conducted. The Office feels that all contractors, both large and small, are entitled to the same types of training and that the same basic knowledge should be imparted whether the organization is located in a highly industrialized city in the eastern part of the country, or located in a farm community in the western part of the country. Certain fundamental principles must be applied regardless of size or geographical location.

Lt. Gen. William S. Knudson, Director of the Air Technical Service Command, has said: "For decades to come, the nation's entire economy—and that means jobs and money in the bank and a chance to send your son to college—depends on the outcome of the job we have ahead of

us.'

"Labor will have to understand that there will be some unemployment as we terminate contracts and cut back production. Management must realize the necessity for the prompt presentation of bills to the government. The Government in turn, has a tremendous responsibility in settling these claims, turning excess property to other uses and at the same time continuing the kind of production it will take to beat Germany to its knees and knock Japan senseless."

A Cooperative Program

Training of contractors in contract settlement procedures is a cooperative enterprise. The War and Navy Departments, and all other contracting agencies in the government, including the War Production Board and the Smaller War Plants

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Corporation, are cooperating with the Training Division of the Office of Contract Settlement in the training of war contractors. Twenty Termination Coordination Committees have been established in the most important manufacturing centers of the country with representatives of all the procuring agencies in the area, the War Production Board and the Smaller War Plants Corporation serving on these committees. Each committee has formed a subcommittee to handle training problems and to maintain uniformity in the actual practices employed in training.

All possible use should be made of them in helping to train contractors since it has been shown that the primary weakness in speedy contract settlement has been that too many claims are incorrect when submitted. They give evidence of the lack of "know how." This deficiency should be corrected while there is still time.

It is known that one specific type of training program will not meet the training needs of all contractors or that the same type may be used in all parts of the country. There-

fore, various types of training have been designed, as indicated on the chart shown herewith, ranging all the way from half hour talks through a single three to six hour session to a multiple session program lasting as long as five days. These courses make use of instructors obtained from government personnel, both military and civilian, and university personnel. Close supervision is necessary to maintain high standards and uniformity of instruction.

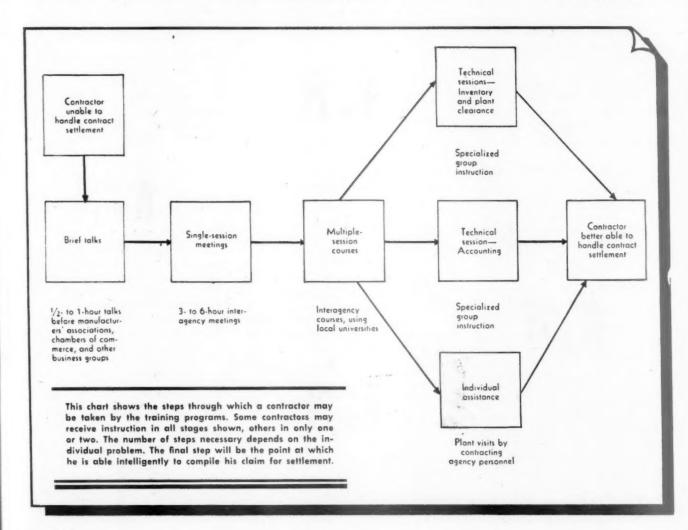
Short Courses Available

No stone is being left unturned by the Training Division of the Office of Contract Settlement in the planning of methods and courses of training to be made available to contractors. Contractors with large organizations are in a position to send employees to multiple session courses and attendance at this type of course has indicated that this is true. However, the smaller organizations quite often are unable to spare personnel from their duties for the longer periods of time. Therefore this Office, in cooperation with the War and Navy Departments, have devised shorter courses to meet the training needs of these contractors. It is recognized that should these contractors remain untrained and lacking in the "know how" of settlement procedures the results could have far reaching effects on the entire economy of the country.

Some companies may find it advisable to conduct courses to be attended by only their own subcontractors and suppliers. This type of training course is proving successful in areas where it is now being used. In this type of training, provisions may be made to have personnel from the procurement agencies with which a company has contracts, as well as company personnel available to conduct and assist in the training and to answer specific questions.

A definite advantage in this type of session is that it allows for an interchange of ideas, it gives the contractor in lower tiers the feeling that his prime is truly concerned in giving him assistance. There are, however, pitfalls to be avoided in this type of session, chief among them being too large attendance at any one session. It has been demonstrated that if the attendance is held

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Important Review of 1944 Purchase Contract VERDICTS

By LEO T. PARKER

D URING the year 1944 the higher courts in the United States rendered many interesting and important decisions involving sale or purchase contracts. Due to present unusual conditions, all Purchasing Agents should keep abreast with modern law, particularly because a great percentage of decisions actually modify and reverse the recognized law of only a few years ago.

Therefore in this article we shall briefly review many important 1944 decisions in view of imparting to readers record and data of these new and modern citations for future reference, first, to use as a guide to avoid similar litigations and, second, to assist winning unavoidable legal controversies during 1945. Obviously, because of the numerous cases hereinafter cited no attempt will be made to explain in detail the various suits, but the most important points of law decided by these higher courts will be briefly explained.

Implied Warranty

There are two kinds of guarantees, namely "expressed" and "implied." An expressed guarantee is one where the seller verbally or in writing states the exact quality of the merchandise.



In Bedner v. Dunigan Tool and Supply Company, 180 (2d) 919, reported July, 1944, the higher court held the recognized test of an implied warranty is: Did the buyer inform the seller of the circumstances and conditions which necessitated his purchase of a certain article and left it to the seller to select the particular kind suitable for the buyer's use?

This court said:

"The rule is recognized that when the article purchased is entirely worthless for the purpose for which it was known to the seller to have been intended, the buyer is entitled to rescind the contract and recover back the purchase money paid, provided 'the purchaser as soon as he discovers this fact promptly notifies the seller and tenders back the property."

Two Guarantees Valid

A seller may be liable on both an "expressed" and an "implied" guarantee. In Georgetown Towing Company v. National Supply Company, 29 S. E. (2d) 765, reported July, 1944, the higher court held a seller liable and said:



"In a case of this kind, the buyer may recover, in addition to general damages, any special or consequential damages which he may have suffered by reason of breach of warranty, and which are the natural and direct or proximate result of the breach."

Not Guaranteed

Modern higher courts held that either a seller, or his salesman, may make strong claims for the quality of his merchandise without being liable on either an expressed or implied guarantee.



In Will, 37 Atl. (2d) 351, reported July, 1944, it was shown that a salesman said that his merchandise was of a very good grade and should give the buyer complete

satisfaction. The higher court held the seller not liable on a guarantee.

Warranty Breached

In Bunch v. D. S. Etheridge Company, Inc., 181 S. W. (2) 225, reported January, 1944, the higher court held where either a buyer or



seller asserts that the other breached a warranty he, who makes the assertion, must prove his contentions, or the other will be awarded a favorable verdict.

Seller Credits Purchaser

Modern higher courts consistently held that when either a buyer or selfer breaches a valid contract of sale the other party is at decided advantage.

In Bedner, 176 S. W. (2d) 220, reported February, 1944, a seller



sued a buyer to recover payment for merchandise. The testimony proved that the purchaser had breached the original contract and returned a portion of the merchandise to the seller.

The higher court held that the seller need not credit the purchaser with more than one-half the original price which he had contracted to pay for the returned merchandise.

Stolen Equipment Bought

In Argens v. Whitcomb, 147 Pac. (2d) 501, reported May, 1944, it was shown that eight months after a purchaser accepted delivery of certain equipment, for which he paid \$1,400 cash, a suit was filed against him by one who proved that the equipment had been stolen from

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him. The higher court ordered the purchaser to give possession of the stolen equipment to the true owner. Also, the court ordered the seller to



pay to the purchaser the full contract price of \$1,400, plus interest, and the court held that the purchaser need pay nothing for use of the equipment during the eight months period he had used it.

Must Test Quality

In Middlesboro Gem Company v. Capps, 180 S. W. (2d) 567, reported June, 1944, the higher court held that before a purchaser may



repudiate a contract for breach of warranty, he must test the goods with a bona fide effort to determine whether the quality is equal to the seller's guarantee.

Statute of Limitations

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In Cazalet v. Cazalet, 54 N. E. (2d) 61, the higher court held where two state laws specified different periods for "outlaw" of obligations under written and verbal contract, the law of verbal contracts is applicable, if oral testimony must be relied upon to prove the contents of the contract and obligations of the

Lower Court Reversed

In Roth v. Hyer, 142 Fed. Rep. (2d) 227, reported June, 1944, the higher court held where a higher



court reverses a lower court the case automatically goes back to trial on all issues, as if the former trial had not taken place.

Experienced Witness

In Franks v. Jirdon, 14 N. W. (2) 372, reported July, 1944, a seller sued a purchaser to recover the balance due on a sale contract.

The purchaser argued that the merchandise did not equal the quality

guaranteed by the seller.

The higher court said that the purchaser could introduce as witnesses in his favor persons having qualifications showing them to be capable of forming opinions which may reasonably be expected to be correct and trustworthy as to quality of the goods delivered. However, this court refused to permit persons to testify in behalf of the



purchaser who failed to prove that such persons were experienced in judging the quality of the merchandise in litigation.

Market Value

In Nottingham v. West, 27 S. E. (2d) 44, the higher court held testimony as to market value of mer-chandise is "opinion evidence" and does not have to be accepted except where there is no conflict as to the value of the merchandise.

Arbitration Agreement

In Reed, 173 S. W. (2d) 346, it was disclosed that the parties to a



contract agreed that in event controversy should arise they would arbitrate.

The higher court said that when parties to a contract agree to submit questions which may arise thereunder to an arbitrator his decision is final and conclusive, unless he practiced fraud or misconduct.

Usury Bars Seller

In Mid Loan Company v. Madsen, 14 N. W. (2d) 475, reported August, 1944, it was shown that a purchaser purchased merchandise under a conditional contract by the terms of which he agreed to pay monthly installments. By illegal manipulations the "balance due" price was increased whereby full legal rate of interest charged on this amount resulted in usury on the true balance due. Litigation developed later and the higher court held that although the party who held the

notes did not know that an illegal rate of interest was being paid by the purchaser, yet he could not re-



ceive a favorable judgment on a suit. This court said:

'Violations of the statutes relative to usury are presumed to be in-

Must Rescind Promptly

In Sherman, 180 S. W. (2d) 565, reported July, 1944, a purchaser sued a seller to rescind a sale contract on the ground of fraudulent representations. The purchaser discovered the fraud immediately, but instead of notifying the seller he made a payment after he discovered the fraud. The higher court refuses to allow the purchaser to rescind the contract.

Fraud Defined

In Chicago, 145 Pac. (2d) 172, a modern higher court said that either a buyer or seller may rescind a contract of sale on the pleas of fraud. This court said that "legal" fraud is any act, deed, or statement made by either a seller or a purchaser before the purchase contract was signed or completed, and which is likely to deceive the other party.

Statute of Frauds

Certain verbal contracts are void under the Statute of Frauds. In Hayes Mfg. Corporation v. McCauley, 140 Fed. Rep. (2d) 187, reported February, 1944, the higher court held a written contract extended or enlarged by a verbal agreement retains its legal status as a written contract. This court said:



"Nor are we persuaded that the alleged oral agreement was void under the Statute of Frauds. It has been held that a mere extension of time need not be in writing."

On the other hand, see Illinois, 52 N. E. (2d) 47, reported December, 1943, where it was disclosed that a buyer and a seller entered into a written contract for sale of merchandise. The term of this contract was one year. Later they made a verbal agreement with almost identical promises, terms and provisions but with the provision that the original contract was to be extended from one year to two years. Many letters passed between the parties in which the verbal agreement was mentioned.

The seller breached the two year contract and the purchaser filed suit for damages. The seller defended



the suit on the grounds the agreement was oral and void under the Statute of Frauds because it could not be performed within one year.

The higher court refused to agree with this argument and held that correspondence verified the verbal agreement, whereby the contract was legally "written" and was not within the Statute of Frauds, which requires agreements which cannot be performed within one year to be in writing.

Interpretation of Contracts

In Shepard v. Shepard, 15 N. W. (2) 195, reported September, 1944, the higher court said:



"Generally speaking, the cardinal rule in the interpretation of contracts is to ascertain the intention of the parties and to give effect to that intention if it can be done consistently with legal principles. It has been said that to this paramount rule all others are subordinate. The parties should be bound for what they intended to be bound for, and no more."

Must Prove Receipt

Many Purchasing Agents are under the erroneous belief that a receipt issued by a seller always is valid and effective.

In Oliver v. Andrus, 17 So. (2d) 748, reported July, 1944, the litigation involved an open account of which the books of the seller showed that the purchaser owed a balance. The purchaser contended that he owed nothing and that he had paid the account in full. He showed a

receipt which he alleged had been given to him by the seller, who denied that he had given the receipt.

The higher court refused to credit the purchaser's account for the amount of the receipt because the purchaser failed to prove that the receipt was authentic.

Therefore, where controversy develops over an account, the purchaser is required to positively prove payments alleged to have been made. If the purchaser possesses a receipt he must prove that either the seller or his authorized agent issued such receipt, otherwise the court will rot approve the credit.

Check Not Full Payment

In Sawyer v. Staples, 29 S. E. (2d) 892, reported July, 1944, the higher court held acceptance by a seller of a check later claimed by a purchaser to represent full payment



for purchased merchandise is not legal full payment if when the check was accepted, or before it was cashed, the seller notified the purchaser that he was not accepting it in full payment.

Salesman Practices Fraud

In Elm Supply Company, 14 So. (2d) 585, it was disclosed that a seller sued a purchaser to compel the latter to accept delivery of certain merchandise. The seller introduced a signed contract.

The purchaser testified that the seller's salesman had told him that the contract which he signed was merely an order for a less quantity of merchandise. The purchaser admitted that when he signed the con-



tract he did not read what he was signing because he believed the salesman.

Although the lower court held the purchaser bound by the signed contract, the higher court reversed the verdict.

Fails to Record

In Carroll v. Godding, 38 Atl. (2d) 720, the higher court held the

purpose for recording a conditional contract, or mortgage, is notification to all in the United States that the seller retains a lien on the subject of the sale. This court also held that although the instrument is not recorded the seller retains his lien with respect to all persons who knew that the lien existed.

In Bobbitt v. Cundiff, 177 S. W. (2d) 596, reported March, 1944, the higher court held:



"The rule is that the superiority of lien claims depends upon the exact time of day the attachment was placed in the hands of the sheriff and the exact time of day the mortgage was lodged for record with the clark."

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Purchaser Accepts One Shipment

In Tucker Duck and Rubber Company v. Byram, 177 S. W. (2d) 759, reported April, 1944, the litigation involved a contract which specified that a seller would ship purchased merchandise in several installments. This court said:

stallments. This court said:
"Generally, where goods are ordered to be delivered in installments.



shipment of one or more of the required installments constitutes an acceptance of the order in its entirety."

Salesman's Contract

Generally speaking, a "contract" taken by a salesman merely is a legal proposal or offer of the purchaser to buy merchandise, and if the salesman's employer fails to "accept" the offer no enforceable contract exists.

However, see Celadon Company v. McKinley, 11 N. W. (2d) 839, reported February, 1944, where a salesman's employer failed to approve the contract but proceeded to manufacture the goods for the purchaser. The court held that this act of the employer resulted in a valid contract although he did not accept, approve or otherwise notify the purchaser that he considered the contract valid.

Selecting Economical Voltages for Medium-Size Industrial Plants

If you are contemplating plant modernization, expansion, or reconversion, now is the time to analyze plant distribution system costs

By D. L. BEEMAN Industrial Engineering Division General Electric Company

WHICH is the more economical basic distribution voltage for a new, medium-size industrial plant, or an existing plant being reconverted, modernized, or expanded: 2400 or 4160 volts?

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Many operators will say 2400 volts, and for an apparently logical reason. A sizable percentage of the total electric power in many industrial plants is consumed by motors ranging from 40 to 500 horsepower. Since motors in that range can be connected directly to 2400-volt circuits, it is commonly believed that the lowest-cost electrical system—including power generation, distribution, and motors and control—can be obtained by distributing purchased or generated power at 2400 volts. A review of the factors which

influence system cost indicates that such is not the case.

Studies of specific systems show that, so far as overall electrical system costs are concerned, it is nearly always less expensive, to use 4160 volts primary or generation voltage rather than 2400 volts, and to operate most motors of 200 hp and less on 460- or 575-volt circuits. This conclusion is based on the data shown in Fig. 1. The derivation of these curves is explained in detail later in this article.

Advantages of 4160 Volts

The 4160-volt system offers many important advantages other than lower cost. Short-circuit current bottlenecks are not reached as readily as higher system short-circuit kva can be tolerated in 4160-volt systems, compared with the 2400-volt systems, before it is necessary to introduce reactors or to resort

short-circuit currents. In general, fewer primary feeder positions and less cable are required for the 4160-volt distribution system compared with one using 2400 volts. This reduces the space required for housing the switchgear, and also the space required for conduits for the primary cable.

From the standpoint of safety, it is generally concluded that there is substantially no difference between the commonly used 2400-volt delta system, which normally is not grounded, and the 4160-volt system with the neutral grounded according to modern recommended

practice.

To select the most desirable primary or generation voltage would necessitate comparing all voltages below 15 kv. This would be rather involved and is beyond the scope of this article. The main consideration in many medium-size industrial

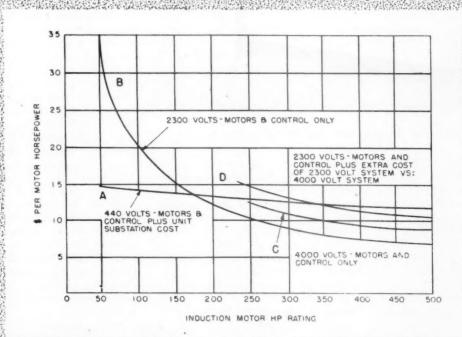
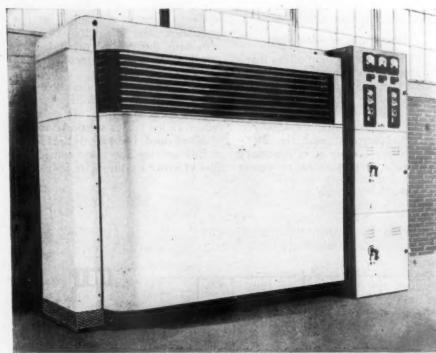


FIG 1





Unit substation, consisting of a transformer and one secondary breaker

plants is whether to use a 2400- or a 4160-volt primary power system. The remainder of this discussion is limited to an economic comparison of these two voltages.

In some areas 4800 volts is the standard primary voltage. The basic factors presented here are not substantially altered whether the voltage is 4160 or 4800 volts. Since 4160 volts is far more common than 4800 volts, the former will be

used as a basis of comparison.

In studying the economics of this problem, certain basic equipment and system elements were considered. These are discussed in the following paragraphs, with an inclusion to show the effect of other types of motors and motor starters than those listed below.

Standard squirrel-cage induction motors are by far the most common. Therefore, to make this study as

representative as possible, these motors have been considered as a basis of comparison. The curves in Fig. 1 are plotted for 1800-rpm motors.

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There has been a tendency to totally disregard short-circuit current interrupting duty imposed on motor starters for short circuits which may occur on the load side of the motor starter. Adequate interrupting capacity is desirable in the motor starters to safely and quickly open these short-circuit currents. When a fault occurs on the load side of the motor starter and the latter does not have adequate interrupting capacity, it may fail and endanger nearby personnel and property. It may also cause the feeder circuit breaker to be tripped out, thus dropping service over a large area of the plant and, as a consequence, substantially affecting production. From this it can be seen that it is equally as important to select motor starters with adeshort-circuit interrupting quate rating as it is to select feeder circuit breakers with adequate interrupting Therefore, only modern combination motor starters, such as illustrated, are considered in this basic comparison.

System Factors

To use 440- or 550-volt motors in a plant in which the primary or generation voltage is higher than 600 volts requires a transformation to less than 600 volts for these motors. Therefore, when comparing 440-volt motors to motors operating directly at primary voltage (i.e., 2400 or 4160 volts), the installed price of a step-down substation must be included with the 440-volt motors and control. This substation is included at \$4.00 per horse-power. This figure is based on the installed price of a unit substation, consisting of a transformer and one secondary breaker. It is assumed that, due to diversity, one kva of transformer capacity will care for 13/3 hp of motors. Since branch circuits to 440-volt motors usually require larger cables than do 2300- or 4000-volt motors, fifty cents per horsepower was included in Curve A to cover the cost of the larger 440-volt cables. The one-line diagram of the circuit elements for 440- or 550-volt motors, operating from 2400- or 4160-volt primary systems, is shown in Fig. 5. The cost of the low-voltage motors, control, and the step-down unit substation is plotted as a function of motor horsepower rating in Curve A. Fig. 1.

When selecting the primary voltage of the power distribution system, it is necessary to consider more than just the prices of the motors and control which operate at primary voltage—i.e., at 2400 or 4160 volts. The approximate prices of high-voltage motors and control only, Figs. 6 and 7, are plotted in Fig. 1 on Curves B and C.

Motors Operating Directly at Primary Voltage

The cost of the primary system must be considered as well as the cost of the motors and control if the lowest over-all electrical system cost is to be obtained. In factoring the primary system cost, it is assumed that if the power is distributed at 2400 volts, 2300-volt motors will be used; and if the power is distributed at 4160 volts, 4000-volt motors will be used.

In industrial plants with a total demand of a few thousand kva, the primary power system (i.e., the generating plant or main step-down substation from the utility system) and the primary switchgear and cable cost about \$2.00 more per kva for 2400-volt primary voltage than for 4160-volt primary voltage. This cost differential will increase to about \$4.00 or \$5.00 per kva for systems about 10,000-kva and larger.

Therefore, if a 2400-volt system is arbitrarily chosen in place of a 4160-volt system, the extra cost of the entire 2400-volt over the entire 4160-volt distribution system, plus the cost of 2300-volt motors and control, must be compared with the cost of 4000-volt motors and control for those motors which operate at primary voltage.

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This comparison can be made by

referring to Curves C and D in Fig. 1. These curves show that the 2300-volt motors and control, plus the extra cost of the 2400-volt power system, are more expensive than 4000-volt motors and control. For the general case, then, Curves C and D, and not Curves B and C, should be used when selecting the primary system voltage for plants where a sizable portion of the total connected load consists of motors larger than about 200 hp.

The total extra cost of the entire 2400-volt power system over a 4000volt power system has been included at \$4.00 per horsepower of highvoltage motor, i.e., \$4.00 per horsepower was added to Curve B to obtain Curve D. This figure (\$4.00) is arrived at by the well verified assumption that complete 2400-volt power systems cost \$2.00 more per kva than 4160-volt power systems, and that an equal kva capacity of power system is required for serving motors operating at primary voltage and to serve all other load which is operated at 600 volts or less. If the high voltage motors require only one-half the system capacity for supplying them, that means that the two kva of more mostly 2400-volt system capacity (at \$2.00 per kva extra) is required per horsepower of high voltage motor. That is the equivalent of \$4.00 per horsepower of 2400-volt motors.

Figuring Costs

System costs are usually given in dollars per kva but are added in Fig. 1 as dollars per horsepower, on the basis that the kva and horsepower ratings of high-voltage motors are about equal.

By referring to the curves in Fig. 1, it can be seen that below about 175 hp, 440-volt motors enable the least investment in the electric system voltage. Hence all motors rated about 200 hp or less should be operated on systems rated 600 volts or less, regardless of the primary equipment, regardless of the primary voltage selected.

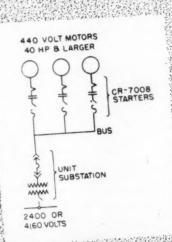
Most Economical Voltage

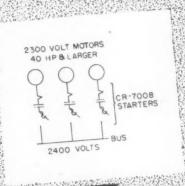
A close examination of the detailed prices will show that at 200 hp the cost of 440-volt motors and starters in step-down substations, Fig. 2, is about equal to the cost of 2300-volt motors and starters, Fig. 3. This is the reason for placing the arbitrary division at 200 hp rather than at 175 hp, as pointed out by the curve. These curves represent approximate prices and do not follow detailed variations.

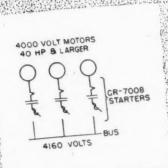
Hence there is no justification for ever arbitrarily selecting 2400 volts as the primary voltage so far as any considerations of motors of 200 hp and below are concerned.

Primary System Voltage

Assuming that there will be a transformation from either 2400 or 4160 volts to supply motors rated 200 hp or less, the choice between these two primary voltages is based on primary system costs and the cost of motors and control for these motors rated above 200 hp. pointed out previously, and as shown in Curves D and C, Fig. 1, the selection of a 4160-volt system and 4000-volt motors and control (for those motors rated 200 hp) enables a less expensive over-all installation than the selection of a 2400-volt system and 2300-volt motors and control. In areas where







the larger motors (i.e., those above 200 hp) constitute more than about 50 or 60 per cent of the total load, 2400 volts may be less expensive providing the total load of the plant is not more than a few thousand kva.

In general, an equally satisfactory, yet a lower cost power system can be obtained by selecting 4160 volts as the primary voltage for general power distribution, rather than 2400 volts.

Using 2400 Volts

In plants which are served at 2400 volts directly from the utility system, then, of course, it would be more economical to use 2400 volts directly and to place all motors rated 200 hp and above directly on the primary feeders. However, in these cases, nearly all motors rated 200 hp and less should be operated on a 460- or a 575-volt system, stepping down from a 2400-volt primary system. In some cases where there are existing 2400-volt systems in industrial plants, it is often more economical to extend these at 2400 volts rather than change to 4160 volts. However, it may be more desirable to extend it at some higher voltage, like 13.8-kv, rather than to extend the system at 2400 volts. This has proven to be the case in many recently made studies of plants which are to be expanded and modernized. A discussion of this is

beyond the scope of this article.

Twenty-four hundred volts is particularly applicable to concentrated loads which supply motors rated 200 hp and above, and where the primary voltage is above 5 kv. In these cases, it is preferable to step down from the higher voltage to 2400 volts rather than 4160 volts if the capacity per 2400-volt bus is limited to a few thousand kva, and nearly all of this load is utilized at this bus directly by motors rated above 200 hp.

A typical application where 2400 volts would be most economical is a pumping station, Fig. 5, in which the control may be the fused contactor type of the vertical-lift power circuit breaker type where the vertical-lift feature is desirable and where the frequency of starting is not too great. If this preference is followed, it will be necessary to make a transformation for these large motors. The cost of the transformation is substantially the same whether it is made to 2400 volts or to 4160 volts. Hence the power system cost is not a significant factor, since all of the load is concentrated in one place. The 2300-volt motors and their starters are less expensive than 4000-volt motors and their starters. This can be seen by comparing Curves B, C, Fig. 1.

Where 2300-volt mofor starters of 50,000-kva interrupting rating

can be used, some reduction can be obtained in the over-all cost of the 2400-volt installation compared with the lower voltage installation for motors below 200 hp. This merely reduces the crossing points of Curves A and B, Fig. 1, to about 150 hp.

Effect of Motors and Control

Even if plain motor starters (the use of which is not generally recommended) without built-in shortcircuit protection are considered for both the 2300- and 4000-volt motors, there will be little change in the relationship. These variables, together with the effect of explosion-proof requirements, have little bearing on the basic factors presented here. As a matter of fact, most variables, such as special induction motors, or special starters, will tend to make Curve B cross Curve A at a higher horsepower rating than shown in Fig. 1. Although Fig. 1 is plotted using 1800-rpm motors as a base, other motor speeds over the 600-3600 rpm range have little effect on the general relationship of those

Synchronous Motors

There is less price differential between low voltage (600 volts or less) and 2300-volt synchronous motors and control than there is between induction motors and control for these voltages. This differential will tend to make Curve B cross Curve A at about 150 hp instead of 175 hp, as shown for induction motors, Fig. 1.

In many industrial plants, the great majority of the motors are rated less than 200 hp and hence are operated from 460- or 575-volt distribution systems. In these plants there may be one or two motors which are considerably larger than 200 hp. It is often more economical, depending upon the size of the motor, to operate these larger motors directly from the 460 or 575-volt system than it is to provide a special transformer to step down to 2400 or 4160 volts where the primary voltage is above 5 kv.

Summing it all up, it is, in general, most economical, to operate all motors rated 200 hp and less on systems rated 600 volts or less, regardless of the primary voltage. Where a choice of primary voltage can be made, it is in most cases more economical to select 4160 volts rather than 2400 volts, even where the percentage of motors above 200 hp is as high as 50 to 60 percent of the total plant load.

PRIMARY BEAKER

2500 KVA

2400 VOLTS

WM SO KVA
480 VOLTS FOR MISC
POWER AND LIGHTS

TYPICAL LAYOUT FOR PUMPING STATION

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IS YOU IS - OR IS YOU AIN'T?

By CHARLES FORD

F we are ever going to have a peace settlement in this tank-trodden, plane-pummeled, shot-shattered world of ours, it will be because a great majority of people get it firmly lodged in their systems that peace must prevail, and not maybe. An old acquaintance of mine who ran stationary engines was bragging that he could make steam with stable manure, if he got enough of it: "By Godfrey, if you're goin' to git steam you've got to git combustion, and the only way to git

combustion is to combust!"

If we're going to have anything but a Donnybrook peace we damned sure must make up our minds and go after it. A real peace, and not one full of cactus and prickly pear like the last one.

Seeds of Strife

Just how are we going to work it out? Rivalries spring up under all circumstances, just as weeds flourish in all sorts of soil. Maybe you can't get any kind of a crop of spuds or cawn or cotton or terbacker, but you can raise a hell of a lot of weeds without trying at all. Out of this scrap-fest may spring up the worst crop of hate-weeds in history. Our

We've got to buckle down and earn a lasting peace if we hope to enjoy it

soldiers and sailors are the fightinest lot that ever faced gunfire; they are also probably the most tolerant. When they are home and mobilized for peaceful endeavor, they will harbor less real resentment than any other people in the war.

But don't think they are going to love the Apes and the Huns. Not none. The minute he sees a Kraut or a Jap, every man-jack who has fought in this man's war will ache to give him a swift smack in the puss. If there were any really good reasons for the start of the rumpus they wouldn't feel so strongly about it; but this terrible destruction of lives and liberties, this wanton rape of every peaceful pursuit we knew, grew out of just plain greed and envy.

Two Chances Wasted

The last time we warred with the Huns they had thrown away their day of grace with the same wanton disregard shown by a peevish kid tossing a playmate's doll into the fire. They had waxed commercially, and become a thorn in the side of every industrial country in the world. They had trade by the tail and were dragging it off bodily. If they had merely kept on as they were going, by this time their patience, industry, scientific ability and silent craft would have landed them on top of the heap. They had us pretty nearly licked without a scrap.

But, side by side with their trade machine, they had built a military machine the first in the world, and they just had to try it out.

They tried it out.

Then, when we and our allies had waked up and hammered the living hell out of them, and could have made it stick, we and our allies proceeded to make star-spangled idiots out of ourselves. Between the hatreds that had boiled up, and the greed of some of the victors trying to grab off what little Germany had left—the fear that if they didn't grab first with the most fist somebody else might—the whole deplorable business was settled on such a basis that it couldn't possibly stay

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settled. Was it Mark Hanna who said, during the McKinley campaign, that "the damn' Democrats wouldn't stay bought"?

No Profit Without Trade

It was then we took our dolls and dishes and went home, to build about ourselves a high board fence and live by taking in one another's washing. It was nice enough while it lasted; nobody thought anything more about war or peace. There was plenty joyriding and bootleg

whisky.

It took us some time to discover there isn't anything cumulative about taking in one another's washing. We had a hell of a lot of things to sell, and apparently took little interest in getting out and selling them. All we wanted to do was to keep the other fellow from selling his stuff. The feeling spread around the world; and when we waked up to the fact that nobody at all was doing any business and the laundry bills weren't getting paid, then came the pay-off. We were busted, and so was everybody else. It took another war to make us sit up and rub the dust from our eyes; and if we haven't learned something from the last time, we'll make a peace that will leave us all permanently busted.

But what are these boys of ours, coming out of their showerbath of shells, going to think if we let down their generation? After the last war, our own neglect to earn the giveand-take of international trade left us flat. We couldn't keep our people at work because we were too cussed hide-bound to get out and sell the stuff they could make or raise. Like the Bandarlog in the Jungle Books, we perched along the tops of ruined walls with our tails hanging down behind, chanting a litany about how good and great we were-and picking fleas in the intervals.

Ten Million Jobs

Our goodness and greatness had caught up with us; we were taken with our pants down and the galluses busted. We were like the famous pugilist who boasted, in the same breath, that he could lick anybody in the world and at the same time drink up all the rum in town. The present slugging-match may work us out of some of our flatulent ideas. When the war is over there will be ten million or so of the finest young fellows in the world to find work for; and believe me, brother, if that work isn't forthcoming there will be skin, hair, and toe-nails all over the arena.

Scattered throughout army, navy and marines there are a lot of Purchasing Agents in a state of suspense. Some were the real thing, and some apprentices. What conditions will they meet when mustered out, and how will they meet them? Their own perspectives will get a shock; against the background of mud and foxholes and shell-fire and bombs some things that were important to a mere civilian are going to shrink like wool socks in a Chinese laundry. A good many of them can and will take it; but there will be the usual percentage who will follow the lawyers and politicians trying to exploit them via the bonus

But there is also the thought that these men are but paying a debt to the country that gave them a chance to become Purchasing Agents. It takes two to make a trade; and if both sides don't profit a little the trade ain't much good. Ears attuned to the roar of guns don't hear quite the same way as they did when the worst noises that afflicted their ears were those of salesmen suggesting lunch, nor do taut nerves always slacken in an orderly way.

Self-control and poise are always prime assets to a purchasing man; but when he has to maintain them against the background of two or three years playing with shootin'-irons, the discipline is either going to make a strong man of him, or send him to the psychiatrists.

He will have to solve the question: is he IS or is he AIN'T?

Do You Need A Job!

Industrial purchasing is an assignment to challenge the resourcefulness and capacity of any executive

By GEORGE STONE

Dir. of Procurement and Purchasing Lewyt Corporation Brooklyn, N. Y.

S AINTLY patience, diplomatic suavity, super-salesman smoothness, financial acumen, analytical intuition of a psychoanalyst, plus the legal background of a Harvard graduate and the magical power of a Houdini, all contribute towards making a Purchasing Agent.

Possessing the foregoing qualifications, he has the minimum requirements necessary to cope with the everyday problems that confront him. When he reaches the pinnacle of perfection, he will be a prophet without honor in his own land. He must argue with Engineering to procure requisitions in time so that deliveries and projected schedules can be met; cajole or bully them into accepting substitutes or alternates for material needed; interpret CMP requirements and regulations.

Business firms are similar to a restaurant. No matter how much business comes through the door, if there is waste and inefficiency in the kitchen, that restaurant cannot survive. Purchasing Departments are



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the kitchens of industry.

The Purchasing Agent must expedite Material Control, know the requirements of the Production Department, and be able to gage the minimum amount of micellaneous purchases required to keep the plant running on an efficient basis for which non-productive dollars are spent. He must be familiar with conditions of the market, be able to subcontract parts efficiently and economically, locate surplus material, and obtain delivery of vital parts and material within almost impossible time limits. He will probably be blamed if customers' deliveries are not maintained, and expects no recognition for incredible tasks per-

He must investigate new materials and plan for post-war conversion. Upon him will rest a great part of the responsibility as to whether or

Continued on page 300

APRIL



XV. THE FUTURE OF GOVERNMENTAL PURCHASING

By M. E O'CONNOR

F OR several years past it has been evident that there is a Vesuvius seething in government affairs, and public officials should be alert for an eruption. A few of the "high spots" are cited, reflecting the trend of the times in the field of governmental purchasing:

In a survey made by the WPA in 1939, the recommendation was made that all government agencies throughout the United States purchase under Federal Government contracts.

The Council of Mayors has recommended, and Legislatures have enacted, legislation permitting counties, cities, towns, villages, and school districts to purchase under state contracts.

The voice of industry is heard in

This is the concluding installment of Miss O'Connor's series of articles on governmental purchasing. Based on her practical and successful experience as Director of Purchase in the Division of Standards and Purchase, New York State, it provides a sound and authoritative summary of the basic organization, effective procedure, and the social and economic responsibilities of the purchasing officer in public life.

a suggestion that compulsory competitive bidding give way to negotiated contracts as the basis of future purchasing relations between government and industry.

The NRA and the evils of pricefixing have focussed the attention of political opportunists on the attractiveness of contract routing, particularly where there is a commission that can be routed with the contract.

Under Federal regimentation, state and local governments are experiencing a realignment of markets and prices, currently resulting in increased budgets for administrative equipment and supplies.

Emergency purchasing has blazed a trail much of which may or may not be carried over into post-war purchasing.

Some Pertinent Questions

What is the exact meaning of these and other proposed procedures and relocations? Do they represent progress or retrogression and decay? Are government officials prepared to discriminate between the good and the bad in them, in planning the future of government purchasing? Are they prepared for the transition to post-war conditions, and will they profit by pre-war and emergency experience?

Shall government contribute to the creation of monopolies such as may result from the centralization of all government buying through Federal Government channels? How many units of business are tooled to enter such a field of supply, particu-



larly under a statute which is mandatory on the part of the supplier and optional on the part of the buyer—for the record seems to indicate conclusively that for the most part local government wants the privilege of buying under federal and state contracts, without the obligation?

What would be the effect on business, large and small, of combining federal, state and local government purchasing? Will the octopus thus created reach out its tentacles and strangle existing systems of trade?

Have government employees the right to tell the citizens that they will pick and choose the people who will be permitted to sell to government, as they would under negoti-

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ated contracts? Should they have that right? Should public officials, however remote may be their function from the field of purchasing, be permitted to reap a reward from the routing of government contracts?

What is industry's attitude toward government as a customer, and are all government customers rated

alike?

What has happened to state and government markets during World War II?

How do industry and the taxpayers feel about these projects? What will be their effect on the efficiency and cost of government?

Trends in Government

The future of centralized standardization and purchase for government depends primarily on the future concept of government — whether it shall continue to exist and expand as at present constituted, or whether it shall return to the



puritan philosophy that government shall exist only insofar as it serves the public interest. The former may bring a continuation of Federal regimentation of business which will spell the death knell of free enterprise and competitive bidding, as it is known to the government purchasing agent. The latter may place every government agency on trial before a court of public opinion, to justify its existence by demonstrating a substantial dollars-and-cents. saving in the interest of the taxpayers, or an outstanding contribution to some form of public service or welfare.

Competently established and soundly administered, centralized standardization and purchase will survive under either of these alternatives. The first instance will serve as a challenge to the purchasing officer to devise standards and measures which will insure utmost value for every dollar expended under price fixing or uniform bidding, rather than encourage contract routing. In the second instance, he will have no difficulty in demonstrating

the economy inherent in efficient centralized purchasing.

The day of political appointments of unqualified purchasing officers and staffs is past, if government is to hold its place with industry in this field of accomplishment. Purchasing has come into its own since World War I. In that period, when increased production was essential, it was retarded by lack of scientific purchasing methods, and the lesson was soon learned that what was everybody's business was nobody's business. Few industrial organizations then had autonomous purchasing departments, since buying had been an adjunct rather than a key to production. As a result of experience in that emergency, industry began to put its procurement functions in order.

Some ten thousand or more purchasing departments are now operating under the supervision of purchasing officers who have become executives in their own right rather than assistants to management and production. And in the process, thousands of new and useful jobs have been created, that will furnish a potential reserve for employment in the post-war period. The best proof that efficiency in purchasing is in the ascendant is the fact that, in the emergency of World War II, both commercial and governmental purchasing agents are in the fore in the planning of industrial mobilization.

Stock Control Needed

Experience acquired throughout periods of emergency have demonstrated that in the future government purchasing officials can make a substantial contribution to industrial stability by synchronizing their purchasing programs in such a manner as to avoid peak periods in production and to minimize the valleys of depression. Government buying should be fitted into commercial distribution during slow market periods, to the fullest extent possible, to spread employment.



Stock control is essential to this plan, since it is the basis of requisitions. Perhaps more than in any other direction within the mechanics of purchasing, the need for scientific stock control is indicated. Whatever the exceptions, few government purchasing bureaus have the assembled stock record control making possible maximal efficiency in buying, stock turnover, conservation of commodities, and realignment of surplus. In this particular procedure business and industry are highly proficient and have much to contribute to government.

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The plan for the future is rich in opportunity to capitalize on the experience of wartime, particularly in the field of standardization. It would be impossible to describe in this limited space the progress in engineering which has opened up whole new vistas of accomplishment and equipment for the future; or to enumerate the advances in nutrition and medicine which will revolutionize the problems of health and institutional care; the new textiles and fabrics available for clothing and household use; the lubricants and fuels, plywood and plastics, new building and road surfacing materials; the countless worthy substitutes that will replace commodities of scarcity.

Progress is no less astonishing in the elimination of duplication and surplus effort in production. In the post-war era, fewer commodities will serve more purposes because of standardization. In the paper industry alone, the variety of printing papers has been reduced by at least 40%, with no impairment of efficiency or curtailment of sensible selection. In the textile industry more machine capacity is at work producing fewer types, kinds grades, and weaves of fabrics cloths that are more uniform, more substantial, and of better quality. The standardization of uniform and utility cloths for the United States

armed forces, for every purpose and

climate, will prove invaluable in the

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selection of durable fabrics for institutional use if this policy is carried over into peace-time production. Similar programs have been perfected and are in the making in hundreds of other fields, since industry is geared to wartime needs.

This progress must be carried into the future through the cooperation of government purchasing agents, because standardization permits quantity production, and decreased costs of production result in decreased budgets for government administration and maintenance. True, there are countless varieties of shoddy products on the market, but they will eliminate themselves in the face of low prices for better merchandise.

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Every government purchasing agent must keep abreast of the times and assimilate information as it becomes available. Specifications should be modernized and rewritten to take advantage of this progress, to eliminate "specials" and, insofar as feasible, to condense requirements within the grades, kinds, and types of commodities classified for commercial production and use. As a part of a permanent plan, government should eliminate the use of many kinds and types of products for a single purpose.

Quality and Value

Future government purchasing must be based on standards of quality, supported by inspection. There is no denying the fact that too often a chiseler receives an undeserved



contract award because the specifications issued are faulty, or because there is no inspection of deliveries. Such an award is dishonest and unworthy of a public officer. The continuation of this practice will do more to increase commodity prices by discouraging responsible competition and encouraging the delivery of inferior merchandise, expensive at any price, than any of the other unfair trade practices already cited.

Dating back to the NRA, there has been concerted action on the

part of the Federal Government to introduce quality standards into the labeling of supplies. This has been styled regimentation of industry, and attacked as destructive of individual initiative. The trade has always been reluctant to substitute quality labels for nationally advertised trade marks and brands, sometimes arguing that the labels themselves are standards. It would seem that the objective might be accomplished without sacrificing such publicity advantages. If the objection is to the use of federally established specifications and standards, perhaps the trade associations of industry should establish and guarantee their own. Undoubtedly there are many different ways of accomplishing the desired result, ranging from self-regulation of industry on the pattern of the New York Produce Exchange to the "Willing to Certify Sources of Supply" promulgated by the Division of Codes and Specifications of the National Bu-reau of Standards. Possibly the quality label might appear in the invoice, if preferable to actually labeling the merchandise.

From the standpoint of the government purchasing agent, there is need for some guarantee of quality of merchandise delivered, to simplify problems of standardization and inspection under competitive bidding. Without it, the door is wide open to the irresponsible bidder who, while he will take the chance of getting by with a delivery of inferior merchandise, hardly dares to misbrand his wares. Any step that will guarantee that one lot of goods and only one is represented in a delivery, and that the quality is at least equal to the specifications, will simplify government procurement and result in real economy. Whatever the method adopted, it would seem that fair trade standards should be substituted for price-fixing as a stabilizer of industry.

A Voice in Planning

State government should be represented at Washington at all times in the discussion of any proposed legislation affecting government purchasing. State purchasing officers should be informed of legislation in prospect and given an opportunity to be heard, in the best interests of their states and communities. Under such a plan the larger city and county purchasing units could have similar representation, and other local units could be protected and kept informed by the state agents.

There should never be a repetition of the NRA. In all future regulation affecting government purchasing, the acceptance of commissions



by public servants should be discouraged, and industry should be enjoined from the exercise of monopolistic practices that would discriminate against any agency of government or encourage price-fixing, uniform bidding, open-price posting, and contract routing. Every bidder to government should be required to affirm that neither the affiant nor his firm, corporation, partnership, nor anyone acting for him or them has violated any law of the state or nation relating to trusts or monopolies; that there is no collusion in connection with the bid offered; and that neither the bidder nor anyone representing him or his principal has communicated the bid made, directly or indirectly, to any competitor bidding on the contract, or to any person improperly interested in the bid. The Attorney General should prepare the form of such certification, to em-brace each phase of the statutes forbidding trusts and monopolies, and there should be a penalty for falsification, including forfeiture of the deposit with bid.

Procurement Inarticulacy

There has been some talk in the past concerning "procurement illit-eracy". Perhaps the word "inarticulacy" is more applicable to government purchasing below the Federal level. The project of centralized standardization and purchase for state and local government has operated on a "small business" scale up to the present time, as regards coordination of the different units, planning, publicity, and intercommunication. It is time to profit by the experience of big business, to organize, systematize, advertise. While the individual purchasing agent may not be looking for personal prestige, he should not hide his light under a bushel if it can help to raise the standards of proficiency and opportunities for service in the purchasing function, or if it will serve to enlighten his fellows-in-trade. Many of his colleagues may not have had his advantages of educaton, contacts, training, and experience. As a public officer he should share his knowledge for public good.

In the past there has been little organized, systematic planning for general efficiency in governmental procurement programs. There have been few programs. The state departments have made little organized effort to model local agencies to the state pattern, and have contributed little to the solution of the local problems. This must be remedied in the future.



In the post-war period it should not be difficult to find advocates for a program of unification of government purchasing systems, through the development of more uniform planning, policies, legislation, and procedures. A committee of government purchasing agents should be appointed to make a study of purchasing in outstanding fields of business and industry, and of government procurement in its most efficient forms. The recommendations made as a result of this survey, when presented, should be reviewed by an interstate committee of government and business experts. The work as finally approved should become the basis of future systematization for states and communities, insofar as it meets with legislative approval.

This survey would, of course, include city and county purchasing. since the plan for the future calls for extension of the centralized purchasing system to include all states. and the counties, municipalities and small subdivisions of the states, as well as expansion of the existing systems to include a greater percentage of commodity buying than has been previously centralized. As a result of such planning, the few states that have not already adopted a centralized system will be encouraged to do so, and the political subdivisions of the state can organize their purchasing through state or

local control, at their option. They will want to take advantage of possible economies.

As social concepts change, and more money is expended for public welfare outside of institutions, as the states become more and more responsible for local expenditures, there will be increased demand for supervision of expenditures in the interest of economy, through scientific purchasing and expert methods of accounting. State purchasing officers must quickly put their affairs in order, therefore, and expand their facilities to the utmost, so as to be prepared for their part in this increased endeavor, whether they are to serve in a supervisory or advisory Naturally, capacity. the local branches will reflect in some measure the efficiency or inefficiency of the state system.

Working Together

All of these plans, when perfected, will be of little use unless they are publicized, and unless there is cooperation in putting them into effect. This means that the government should have its own "Chautauqua", sponsored jointly, perhaps, by the Council of State Governments and the Council of Mayors. It should include the expansion of an educational program in state colleges and schools, to educate students in the field of government standardization and purchase; a training program in state, county, municipal, and other government purchasing offices, to standardize procedure and capitalize on experience; a lecture course for employees of all governmental departments affected by centralized purchasing statutes, to invite cooperation through a better realization of the work that is being done in their interest; and orientation that will reach legislators, lawyers, econo-'mists, teachers, social workers, vendors, groups of citizens concerned with the principles and economics of government, and the general public.



The program would, of course, include publicity and encourage the publication of books and literature pertinent to the subject. There would be meetings of government purchasing officers to formulate basic policies; conferences of government officials and purchasing officers to consider the needs of departments, institutions, and agencies; and meetings of commercial and government purchasing agents to exchange information and experience. would be close cooperation with trade associations and other representatives of manufacturers, producers, and vendors, for effective consideration of markets and problems of supply and demand, and to bring about a better understanding of the problems of public officials on the one hand and the viewpoint of business and industry on the other.



This is an ambitious program, but not necessarily an expensive one. Indeed, as a matter of policy, every expenditure of public funds in this connection should be balanced by indisputable evidence of resultant economy. Actually, the results of this interchange of ideas will be so valuable as to discount the expense involved. The cooperation established will pay dividends. Even the costs of the suggested procedures can be underwritten. If each responsible purchasing officer can make and publicize a single study each year toward the development of consonant standards and sound purchasing in favorable markets, the actual savings effected will be many times greater than the cost of the entire activity proposed.

That efficient standardization and purchase is a potent antidote to the expanding costs of government is an indisputable fact. Public budgeting authorities who are faced with the problem of balancing income and expenditure are growing discouraged; they already have stretched the purse-strings to the breaking point. Confronted with a national

Continued on page 300



The reversible frame of this Fairbanks-Morse Motor provides for mounting the conduit box on either side. The lead-in can be from top or bottom. The bearing arms can be mounted in any one of four positions, 90 degrees apart. Thus, the motor may be installed in any convenient place—in any

Other features listed below assure low-cost operation, greater dependability, and longer life. Yes, this is the motor of tomorrow, ready for you today.

position, and still retain its protective features.

OTHER PLUS FEATURES

Protected Frame—Dripping liquids and falling particles excluded in any mounting position.

Crossflow Ventilation—Another exclusive feature in frames 224 to 365 inclusive. Air moves in both directions, providing a motor of uniform temperature. No hot spots.

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Recessed Conduit Box—An innovation for neat installations. Choice of conventional box or frame recess with cover flush with frame.

Balanced Characteristics — Motor rated 40°C., with high efficiency and power factor, and excellent starting and accelerating torques.

Ball Bearings - Sealed in and protected.

Copperspun ROTOR

Centrifugally Cast in One Piece
—and of Copper!



Write for information, Fairbanks, Morse & Co., Fairbanks-Morse Building, Chicago 5, Illinois.

BUY MORE WAR BONDS

Fairbanks-Morse

A name worth remembering



Diesel Locomotives • Diesel Engines • Generators • Motors • Pumps • Scales Magnetos • Stokers • Railroad Motor Cars and Standpipes • Farm Equipment

Purchasing Agents and their Assistants are invited to Check the Coupons on the "Know-How" Pages, Nos. 10, 12, 14 and 16, for late catalogs and bulletins on New Products, Materials, Finishes, Equipment, etc.

STAINLESS STEEL HOSE CLAMPS



ALL-Stainless steel
Aero seal hose
clamps, designed
for service where
conditions require
highest corrosion
resistance, are an
nounced by Aircraft Standard
Parts Co., 1727
19th Ave., Rock-

ford, Ill. Lighter and thinner, the bands have greater strength and flexibility than carbon steel clamps. Mechanically interlocked saddle permits elimination of welds. Production is in the most popular sizes—M12, M16 and M20.

SOLID COPPER DIAMOND TOOLS SOLID copper diamond tools are being introduced by the Cleveland Industrial Tool Corp., 4713 Euclid

Ave., Cleveland, Ohio. The tools feature diamonds set in solid copper shanks as well as solid copper matrices. Tests are said to show that the tools throw off the effects of great heat rapidly, and also clamp the diamond more firmly in the setting. Diamond life also is said to be lengthened.

INTERNAL GROOVING TOOL



I N T E R N A L grooving tool that can be used with any ordinary drill press, turret lathe, or boring mill, known as the Waldes Grooving Tool, is announced by Waldes-Koh-I-Noor Inc., Long

Island City 1, N. Y. Cutters are available for cutting of multiple grooves of any desired widths in one operation. Grooves can be located from either top or bottom of a hole. Size range: A-%-13/8; B-17/16-23/8; C-27/16-4; 41/16-51/2.

"ONE MAN GANG" CAR PULLER CLASS 2½ Lo-Hed Car Puller, called the "One Man Gang" is announced by American Engineering

Co., Philadelphia, Pa. Barrel, gear box and motor are integrated in a single, streamlined unit. Starting line pull is 5000 lbs., using a single line, or more with various block combinations. Uses range from hauling railroad cars to pulling skids, logs, bending pipe and other operations.

DUAL FUEL ENGINE



ENGINE capable of instantaneous conversion from oil to gas fuel without change in load or speed has gone into production at Buffalo Works of the Worthington Pump & Machinery Corp. Conversion

from one fuel to the other or adjustment of a combination of both is accomplished by one revolution of a single control wheel. Regardless of the fuel being used the engine operates on the highly efficient Diesel cycle, thus realizing fuel economies heretofore unobtainable in gas engine operation. A pressure of two inches of water is used. Fuel consumption as a gas engine is appreciably less than that of a similar engine operating on the spark ignition Otto cycle. The system is produced by Worthington to cover the entire range of its Diesel sizes.

ANNOUNCE SMALL PRECISION DRILLS HIGH speed micro precision (spiral flute) and high speed watchmaker flat) drills, in diameters .15 milli-

meter (.0059") to 1.00 millimeter (.0394") in both standard and oversize shanks as well as right and left hand construction, are announced by the Chicago-Latrobe Twist Drill Works, 411 West Ontario St., Chicago, Ill.

GLASS BONDED MICA



GLASS bonded mica in sheet and bar form is being marketed by the Electronic Mechanics, Inc., 68 Clifton, N. J. Sheets come up to 19½" x 29¾". Bar stock in rounds and

squares is available up to $29\frac{1}{2}"$ in length and $\frac{1}{8}"$ to $1\frac{1}{4}"$ in diameter or cross section. The sheets are made in thicknesses ranging from $\frac{1}{8}"$ to $1\frac{1}{2}"$. Literature available.

ANNOUNCE SYNTHETIC RUBBER LATEX SYNTHETIC rubber latex, a modification of the butadiene - styrene type of synthetic rubber, is an-

nounced by the United States Rubber Co., Rockefeller Center, New York. It is said to mix well with other ingredients and is easily compounded for uniform viscosity and other desired properties, and to have superior properties in saturating paper and fabrics for shoe parts and other artificial leathers; in the backing of pile fabrics, and in binding vegetable fibres and animal hair in cushioning materials.

STEAM PLATE PRESS



GENERAL purpose steam plate hydraulic press is announced by the Chas. E. Francis Co., Huntington, Ind. The one illustrated is a 30" x 30" x 2", 153-ton capacity press with a motor driv-

en pump unit, automatic pressure and temperature controls, and is equipped with 11 steam plates. Press can be furnished with 14" or 16" diameter cylinder and with or without pumping unit.

(Continued on page 132)

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The odds are 4000 to 1

WE HAVE WHAT YOU WANT!

Whether you need a giant 30-inch Tube-Turn welding fitting weighing more than a half ton, a half-inch fitting with weight measured in ounces, or any of the 4,000 other items in the complete Tube Turns line...your Tube Turns distributor can supply you. He carries an ample stock and can serve you promptly. His

years of successful experience are at your disposal to help solve difficult problems. And back of him, ready to help at a minute's notice, are the nearest Tube Turns factory branch and the complete

engineering staff and facilities of the Tube Turns factory in Louisville.

Remember—Tube-Turn welding fittings were the first welding fittings and are still the best. Let the new Tube Turns Catalog No. 111 show what 18 years' specialized experience means to you. Write for your copy of this valuable handbook today.



THE COMPLETE LINE OF WELDING FITTINGS AND FLANGES

Selected Tube Turns distributors in every principal city ready to serve you from complete stocks.

TUBE TURNS (Inc.), LOUISVILLE 1, KENTUCKY. Branch Offices: New York, Chicago, Philadelphia, Pittsburgh, Cleveland, Dayton, Washington, D. C., Houston, San Francisco, Seattle, Los Angeles.

APR

SIMPLE



WILLSON No. 5 and 45 Lightweight Respirators with easily replaceable filters protect workers. They remove harmful dusts and mists. Bureau of Mines Approvals for various hazards. Filters tested for low breathing resistance.

SAFE



Two sizes for wide range of faces assure safety of a good fit. Form molded rubber facepiece prevents leakage at edges. Adjustable headband and nose spring maintain tight seal.

COMFORTABLE



Comfort features of WILLSON Respirators make them easy to wear. Their light weight requires little headband pressure. Compactness permits full vision—safety goggles can be worn. Washable cotton FACELET* protects face.

*Trade Mark Reg. U. S. Pat. Off.



Get in touch with your WILLSON Safety Service Distributor for full information. Or write Dept. P-6.

GOGGLES . RESPIRATORS . GAS MASKS . HELMETS

PRODUCTS INCORPORATED READING, PA, U.S. A Established 1879

MAGNETIC COMPARATOR

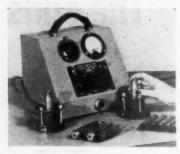


ILLUSTRATION shows the General Electric Magnetic comparator which provides a quick, simple, nondestructive method of inspecting ferrous parts for quality control, and which has been redesigned to permit a more functional arrangement of its components. Desirable for testing rods, bolts, springs, and small fabricated parts, this portable equipment immediately discerns variations in composition, hardness, or other characteristics which affect magnetic properties.

PUMPS FOR PAINTS & MASTICS

VERSATAL is the name of line of pumps announced by Alemite, 1826 Diversey Parkway, Chicago, Ill., for

application of paints, sealers and mastics. They operate on air power and from one to six operators may work simultaneously using as many different spray heads and material lines from a single pump. Material is delivered from the pump at pressures $4\frac{1}{2}$ to $5\frac{1}{2}$ times air pressure introduced to the pump. It supplies material through several hundred feet of hose. Pumps will handle both heavy or light consistency materials under extremes of heat or cold. They are available in several types, and sizes, and also portable model with 12-gallon material container.

STEAM MIXER WATER HEATER

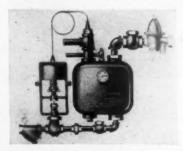


ILLUSTRATION shows compact steam mixer water heater, announced by the O'Brien Steam Specialty Co., 205 Harrison St., Syracuse, N. Y. Manufacturer states this direct-injection type water heater thoroughly mixes medium pressure steam (50 to 150 lb.) with cold water to provide an instant and constant supply of hot water at controlled temperature. Thermal efficiency is put at practically 100%. Unit has automatic temperature regulator, cushioned check valves, strainer.

(Continued on page 120)

DARNELL CASTERS Choose just the right caster or wheel for your needs from

DARNELL CORP. LTD.
LONG BEACH 4. CALIFORNIA
60 WALKER ST. NEW YORK 13. N.Y.
36 N. CLINTON, CHICAGO 6. ILL

the Darnell line



Handy, easy to slip on and off — plenty of pocket room, comfortable, double reinforced midsection. Made of tough extra heavy water repellent material. Saves clothes from heavy wear. Will outwear several pairs of overalls, and gives "around-the-leg" protection. \$2.50 each, three for \$7.20 — less in quantities.

CANVAS PRODUCTS CORPORATION

433 McWilliams Street Fond du Lac, Wisconsin



The Greeks had a word for it!



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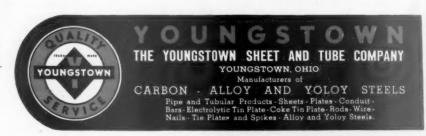
he-.50 The ancient Greek warrior in his chariot, and below, his modern counterpart, the American soldier in an amphibian tank armored with Youngstown steel.

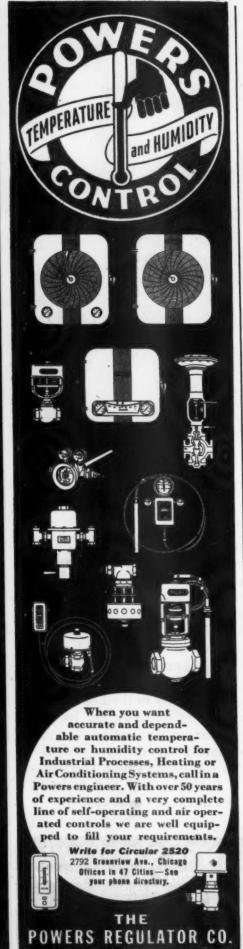
"SIDEROS"--meaning literally "metal from heaven"
--was the ancient Greek word for Steel. It had its origin in
meteoric iron. It was a precious metal, rarer than silver or
gold. Iron, hardened into steel at crude forges, was shaped
into spearheads and swords.

Superiority in the use of steel enabled the little armies of the Greek city states to throw back across the Bosphorus and eventually destroy the barbarian hordes of Persia, bent on conquest of the ancient world.

Today, an ever increasing superiority in the use of steel is enabling America and her allies to destroy the twentieth century barbarian enemies of modern civilization.

Tomorrow, with an overwhelming superiority in the use of steel, America must insist on remaining strong and free--to use its steel to preserve a lasting peace and to build a civilization better than any the world has ever seen.





PORTABLE LEADER FOR PULP WOOD, BARRELS, ETC.

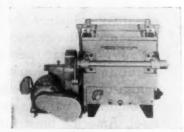


ILLUSTRATION shows portable "Eloader developed by the Noble & Wood Machine Co., Hoosick Falls, N. Y. primarily for the loading of pulp on wood trucks, but which may also be used for loading barrels, drums, bales or other bulky materials. The loading fork which has a lifting capacity of approximately 1,000 pounds is actuated by a 5 hp gasoline motor operating through a friction clutch and worm gear reduction unit. Frame is of welded tubular steel construction, mounted on rubber tired automabile wheels.

DRY DRAWING ANNEALING COMPOUND DRY drawing and annealing compound identified as No. 268, that is applied as a waxy, aqueous emulsion,

is announced by the Plasteel Corp., 3900 West Jefferson Ave., Escorse, Mich. It is designed to be applied in either a drum or spray type mechanical washing machine at an operating temperature of 175 F. Compound is said to to 185 deg. increase die life, reduce number of operations, reduce scrap, and improve pickling, and to be an entirely clean operation from the standpoint of operators, plant and equipment.

METAL PARTS CLEANER



MODEL "B" Simplex Metal Parts Cleaner is announced by the Sturdy-Bilt Corp., West Allis, Milwaukee 14, Wis. Cleaning is by active soak and swishing action. Hot or cold solution may be Specially designed method of used. scum and oil removal has been incorporated in the Model "B". When oil removal tank is full it can be drained and oil filtered for further use. Uses include washing, slushing, cleaning, rinsing and dipping. Units may be installed singly or in series.

(Continued on page 124)



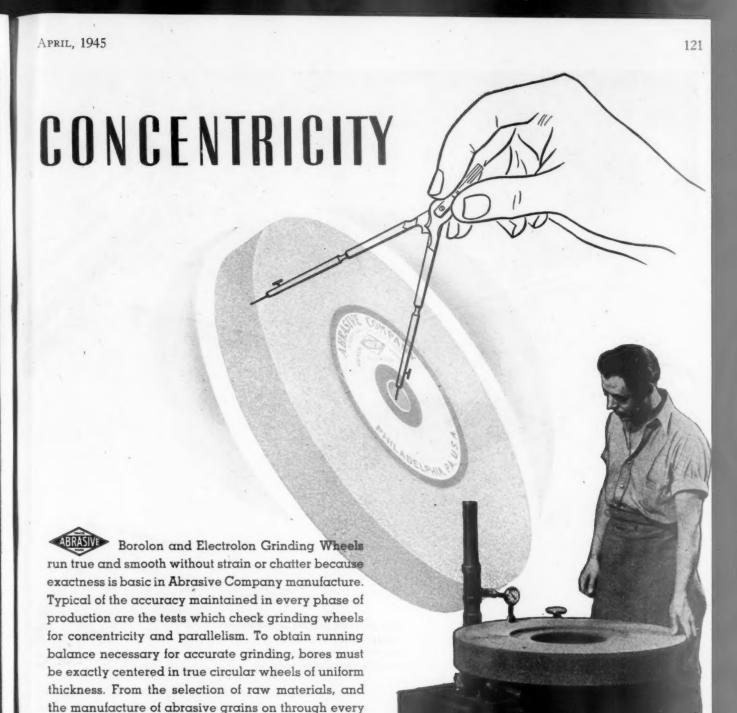
units of 18 carat (No. 1 size) and lettered denote quality of diamond and style of grades -- Common (C), service \$1.00 postpaid.) Bigger stones are LOC. KEY. SET BIG-HED-NI Select (S). genuine All diamonds are immediate shipment to denote quality of (Trade Marks Registered) are Medium (M), grade . -ABLE

No. 24 CN RE-SET-ABLES are now selling in 100 lots. Ask for easy No. 4 Catalog and Grinder's Instruction Card. Shows sizes to fit your machines. Tools backed by service unequalled. . . . Protects from damage

RE-SET-ABLE adds to life of your diamond ... More work per carat. Exclusive pat-Holds firmly

Factory Branche

SHELDON M. E. 41st Street No. 60-CN. 938 DIAMOND TOOL COMPANY, Not Inc. Everywhere



countless scientific tests and inspections govern Abrasive Company quality.

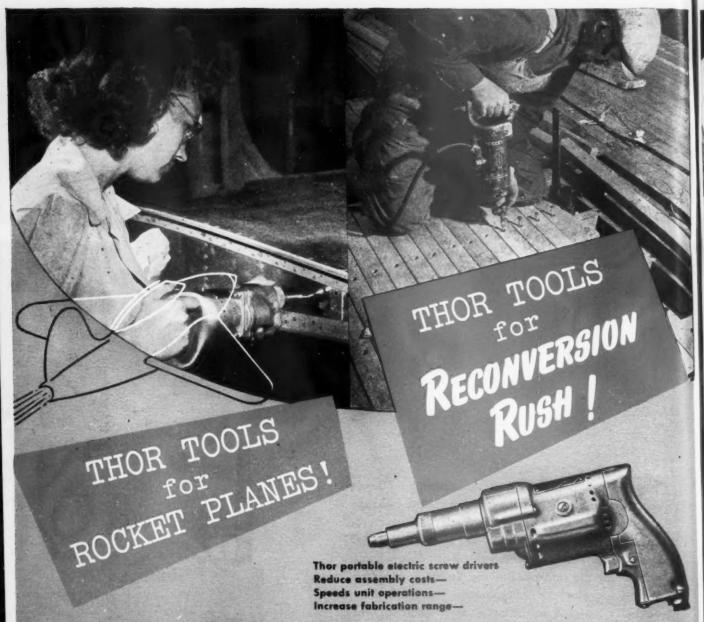
The illustration shows how Abrasive Company Grinding Wheels are "truth tested" with micrometer gauges on face and sides for concentricity and parallelism.

stage of production, constant laboratory control with

There is a Borolon (aluminum oxide) or Electrolon (silicon carbide) grinding wheel, mounted point or wheel to meet the selective service requirements for grinding, cutting, snagging and finishing every type of material. Abrasive Company distributors carry a wide variety of wheels and can be helpful in recommending grains, grades and bonds to produce the best results for specific grinding jobs.



Division of Simonds Saw and Steel Company



War plant production executives in search of portable electric tools have learned to look to Thor for fast, efficient and low cost equipment. This was the line they found to be complete—not only in the kinds of tools but in the variety of models to provide the correct tool for every kind of job.

Thor tools are built for three shift industrial production work with the ample power that assures continuous service yet are so designed that weight and consequent worker fatigue is cut to a minimum.

These are just two of the reasons why the men on whom the country depends for war goods have learned to depend on Thor for portable power tools. Just as soon as you finish making war supplies the reconversion rush will be on—the rush to prepare for civilian goods again. During this reconversion period Thor tools will be in great demand for the tremendous change-over necessary to prepare for the manufacture of peace-time articles. The post war market is estimated to be the greatest in world history. Anticipating your tool needs now you will be in a better position to meet the heavy demands for reconversion and post war production; to give your workers full employment; your company its full share of peace-time profits.

Typical of Thor developments are portable electric screw drivers which not only have brought greater speed and accuracy to assembly operations but will speed the race to rebuild peace-time production lines:—Installation of machines, wall partitions—a thousand other screw driving and nut setting jobs must be done fast to rebuild for productive output.

The tools are available in all speeds and types. The wide variety of attachments are particularly suited to various special operations to make them valuable in rebuilding for peace-time operation...essential for low cost mass production of civilian goods.



New Designs of Thor Tools

Not only will a great variety of new products be made in the future but old products will be made in a greater variety of new ways. In this need for adaptability, production men will remember that Thor has consistently led in the design and development of new and more efficient tools. Today there are more new tools in the Thor experimental laboratory than at any time in Thor history. Just as quickly as these new Thor tools are proved perfect, in laboratory and shop tests, they become a regular part of the Thor line.

When you are again ready ...

to manufacture refrigerators, electric irons, toasters or whatever, Thor will have the portable tools you will need...engineered, designed and built for long, hard, continuous service on top speed production. Since 1893 virtually every major improvement in portable power tools has come from the Thor laboratories. That is why you can safely anticipate your tool requirements NOW and be sure of getting, with Thor, not only the best tools, but the tools you need when you need them most.

INDEPENDENT PNEUMATIC TOOL CO.

600 W. Jackson Boulevard, Chicago 6, Illinois

New York

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Los Angeles



ELECTRIC DRILLS—LIGHT AND HEAVY DUTY DRILLS in a complete range of capacities from ¼ up to 1 ¼ for continuous or intermittent service are available in the complete Thor line of partable electric tools.





ELECTRIC SANDERS AND POLISHERS— THOR 7" AND 9" DISC SANDERS for all metal finishes are sturdy and easy to handle. A THOR POLISHER produces a brilliant durable finish, sayes time and effort.



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ELECTRIC GRINDERS—4", 5" AND 6" DIA. WHEEL Portable Grinders for fast grinding, wire-brushing and buffing on all metal surfaces. 6", 7" AND 10" BENCH GRINDERS in light or heavy duty types are a shop necessity.







LHE many new products of the future pose new abrasive problems-problems that will tax the ingenuity of American industry.

Armour will help you find the right abrasive products and the proper abrasive techniques to help make these new and better things. Years of abrasive manufacturing have given Armour a vast fund of experience and Armour's veteran staff welcomes the opportunity to share this knowledge with you.

As to product, you can't find a faster, sharper, cooler-cutting tool than Armour's Fibre Combination Sanding Disc. This outstanding disc is one of a complete line of Armour abrasives . . . including belts, cones, sheets, bands and specialized shapes.

Yes, great things are in the making for postwar. But until final Victory industry's chief aim remains getting the weapons of war to our fighting men.

For practical abrasive advice, write or call

Armour Sandpaper Works

DIVISION OF ARMOUR AND COMPANY 1355 West 31st Street, Chicago 9, Illinois

SMALL ELECTRONIC PARTS



ILLUSTRATION shows some of the more than 8300 different sizes and shapes of small metal parts for electronic tubes and other precision-built electrical equipments, madfe by Sylvania Electric Products, Inc., Small Parts Divn., Emporium, Pa. Mass-produced on high speed automatic machinery to rigid specification, parts are supplied in steel, copper, phosphor bronze, nickel, tungsten, beryllium copper and other alloys with carbonized, oxidized or plain finish. Parts range up to ½6" in thickness.

NEW SELF-LOCKING DRIV-LOK PINS

COMPLETE line of standard and special selfanchoring, vibration-proof pins, de-

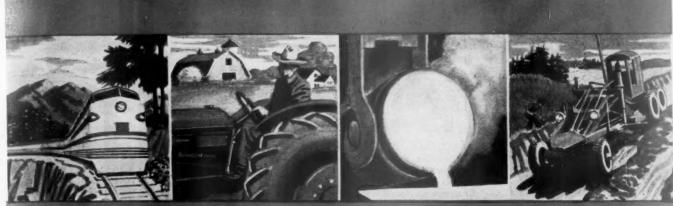
signed to replace taper pins, keys, cotter pins, set screws, rivets, etc., is announced by the Driv-Lok Pin Co., 565 West Washington Blvd., Chicago, Ill. These pins, which are pressed or driven into standard drilled holes, have four flutes on the surface parallel to the axis, which provide an expanded diameter a few thousandths greater than the nominal diameter of the pin. When pin is inserted in a drilled hole, edges of flutes provide self-locking element which it is claimed will hold indefinitely under vibration or shock conditions. They are available in sizes from 3/64" to 1/2" diameter, and from 3/16" to 41/2" in length in any material and in a wide variety of types.

MACHINE TOOL CABINET BENCH



HERE is a machine tool cabinet- bench made by the Lyon Metal Products, Inc., Aurora, Ill. It has a heavy steel top which provides sturdy mounting for small grinders and vices. Bottom shelf and adjustable center shelf furnish 12 sq. ft. of storage space. The cabinet-bench is available in two models: 2345-11, 36" wide, 24" deep, and 34" high. No. 2345-12, same cabinet with builtin flat key locks. Cabinet is finished in green baked enamel.

(Continued on page 126)



Universally used and endorsed by engineers everywhere

The leaders in practically all industrial fields, almost without exception, use Timken Bearings in the products they make - the machines they operate. Such acceptance is due to but one fact - Timken Bearings mean dependable performance. Low cost operation and maintenance are common denominators to all industry and that is why Timken Bearings solving these problems, are a basic and integral part of all industry. It is the reason why engineers, not only in America, but throughout the world, recognize the advantages inherent in Timken Bearings. To insure the utmost in anti-friction bearing performance - first have the application engineered by The Timken Roller Bearing Company and then use the Timken Bearing that our experience recommends.

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO

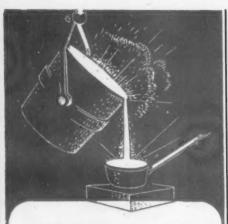
Timken Bearings, Timken Alloy Steels and Tubing and Timken Removable Rock Bits



War Bonds

TAPERED ROLLER BEARINGS

ALL THERE IS IN BEARINGS



- **★ Gray Iron**
- * Semi-Steel
- **High Test** Semi-Steel
- * Any Size up to one ton

Two modern foundries equipped for fast, efficient production can meet your casting requirements.

THE FOREST FOUNDRIES CO. 2500 West 27th St. Cleveland 13, Ohio **PHONE Prospect 5040**

DIMPLES HARD METALS



NEW tool for dimpling hard and brittle sheet metals such as Reynolds 301-T, Alcoa 75-ST and the new lightweight magnesium alloys, is announced by The Glenn L. Martin Baltimore, Co.,

Md., and will soon be made generally available through licensed tool manufacturers. It is known as the Martin Spin Dimpler. It is used in a standard drill press and forms the dimple by spinning the metal rather than by pressing it into Dimples have a sharp edge similar to a machine countersink, leaving no void around the rivet head. Martin Co. has used the dimpler to form 100° dimples for 3/2, 1/8, 5/32 and 3/16 diameter rivets in both aluminum and magnesium alloys varying from .020 to .064 in thickness.

DEVELOP NEW ELECTRONIC INDUCTION HEATER

WITH a low-loss coupling arrangement, new electronic generator developed by Allis-Chalmers Co., Mil-

waukee, Wis., can be adapted to a wide variety of metal-working applications without the use of radio-frequency transformers. Predetermined automatic timing controls each unit operation, assuring uniform production quality. The operator pushes the start button and when the operation is completed, the unit automatically shuts off. The new heater for brazing, soldering, annealing, hardening and pre-forge heating applications is compactly built. All models having a capacity of 10 or more kilowatts operate from either 220 or 440 volts, three phase supply.

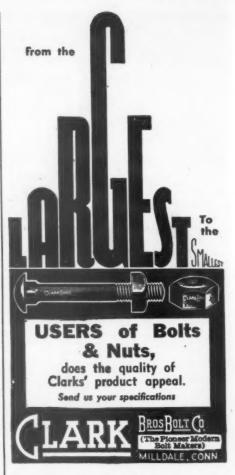
SUPER GRIP COLLETS

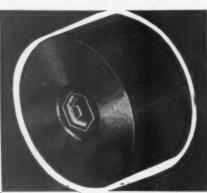


COLLET that incorporates in each serrated section, a "cup-point" lug that penetrates the stock slightly with the collet in the locked position, is announced by Sheffer Collet Co., Traverse City,

Mich. It is known as the Super Grip. Lugs are usually set .010" to .015" above regular serration. They can be adjusted for more or less penetration or can be turned away completely, without removing collet from the machine. The collets are said to be particularly effective for handling hot rolled steel and on jobs where heavy tool thrusts cause slippage. They are designed for holding stock sizes of 2" and larger.

(Continued on page 128)





HARTLEY Special Shaped

No need to worry about facilities for fast and reliable production of special-shaped dies — that's the specialty of the Hartley Wire Die Company.

Skilled workmen, combined with extreme manufacturing care and mest critical inspection, assure you dies of the high quality you require, and the prompt service you desice.

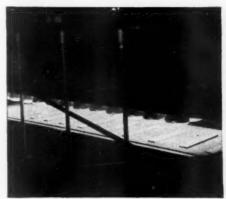
desire.

"From blueprint to finished product" —
that's Hartley service. Just send us the
prints of the dies you require; no problem
is too tough, no job too large or small.
Every assistance we can give is yours.

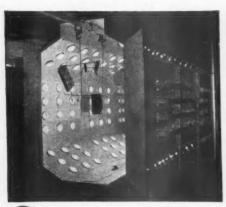
HARTLEY THOMASTON, CONN.

HOW TO PUT THE HEAT ON PLANT PRODUCTION

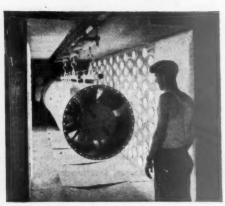
Consider these 4 basic uses for versatile G-E Drying Lamps. They can help you increase your output, save time and reduce costs



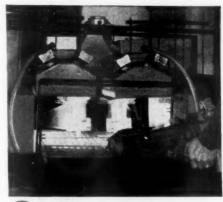
Radiant energy speeds up dehydration processes. G-E Drying Lamps are ideally suited for large or small installations. Extremely low maintenance costs.



Save floor space. This drying oven equipped with G-E Lamps provides high production capacity per square foot of floor area. Installations are movable, flexible and adaptable.



This baking oven—using efficient G-E Drying Lamps—provides more comfortable working conditions. No excessive warmth around the oven. Clean operation and better appearance.



Avoid delays and time losses.
G-E Drying Lamps start and stop instantly—no warm-up needed.
This saves time and reduces costs in heating operations such as shown above.

consult an infra-red oven manufacturer—proper oven design is important to successful operation. General Electric recommends that you call on a recognized oven manufacturer to assure the best results with G-E Drying Lamps. For information on particular applications, get in touch with your nearest G-E lamp office.

G-E Drying Lamp R-40, 250 watts. Efficient reflector hermetically sealed in bulb. Durable, economical, easy maintenance. Smooth, even distribution of radiant energy. Suitable for all types of infra-red installations.



BUY MORE WAR BONDS

GE LAMPS

GENERAL ELECTRIC

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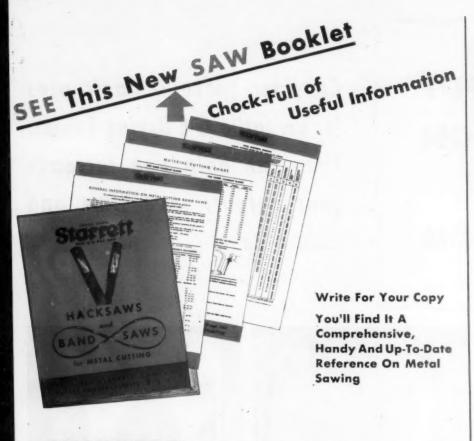
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STARRETT is a good name to stick to on Hacksaws and Metal Cutting Band Saws as well as tools. More and more shops are standardizing on Starrett's because they cut faster, last longer.

FOR HAND SAWING

There's a Starrett Saw for every purpose! Starrett Standard Flexible Back, All hard or "Semi-Flex".

Starrett "5-M" Molybdenum specially tempered for fast cutting of hard metals.

Sturrett 18-4-1 Tungsten High Speed Steel for cutting the complete range of hard-to-cut metals.

The new Starrett "Safe-Flex" a high speed steel blade with flexible back and hard edge, making it virtually unbreakable on the toughest jobs.

FOR POWER SAWING

Starrett "S-M" Molybdenum have a remarkable record of performance and low cost per cut.

Starrett High Speed Steel 18-4-1 Tungsten all hard blades for light and heavy sawing of high alloy metals, stainless steel, phosphor bronze, tool steels, chrome steel, monel, etc.

FOR BAND SAWING

Storrett Metal Cutting BAND SAWS with hard edge and flexible back, available in 10 widths, 3 gauges and 8 pitches, in coils of any desired length, or cut to length and welded ready to use.

Starrett "Skip-Tooth" Metal Cutting BAND SAWS for fast cutting of magnesium, aluminum, bronze, soft brass and other nonferrous metals; also for special compositions, fibre, bakelite, plastics and wood.

Ask your mill supply distributor for Starrett Hacksaws and Metal Cutting Band Saws.



THE L. S. STARRETT CO., ATHOL, MASSACHUSETTS, U. S. A.

World's Greatest Toolmakers

STARRETT

PRECISION TOOLS . DIAL INDICATORS . GROUND FLAT STOCK Hacksaws . Metal cutting bandsaws . Steel tapes GLASS TO METAL SEALS



PROBLEM of guarding various capacitor and resistor types adequately against leaks and moisture is solved by glass-to-metal seal developed by the Sprague Electric Co., North Adams, Mass. On capacitors, the usual ceramic terminals are supplanted by glass bushings which are sealed direct to the metal capacitor container and do not require metal rings with matched temperature coefficients of expansion. On resistors the resistance unit is encased in a special glass tube which is sealed directly to the metal ends. The resulting seals make glass and metal a solid, integral unit, and are leak, shock and humidity proof. Seal sizes range from very small up to 3" in diameter. They work equally well on practically any metal including steel, brass and monel metal. Capacitors and resistors with glass-to-metal seals are now available in 8,000 different electrical characteristic combinations.

WHITE KOROLAC RACK COATING KOROLAC RX solution, used in covering plating racks either by itself or with Koroseal Tape RX is

now being made in white instead of the clear color originally furnished, according to the B. F. Goodrich Co., Akron, Ohio. Used as a stop-off lacquer the white is clearly visible and the operator has no difficulty in determining what portions of a part have been masked. The white Korolac has the same chemical resistant properties as the clear type.

NEW ARO DRILL LINE



ONE-piece aluminum housing features new line of powerful drills announced by The Aro Equipment Corp., Bryan, Ohio. The drills can be equipped with $\frac{3}{6}$ ", $\frac{1}{4}$ ", or $\frac{5}{16}$ " Jacobs Chucks. Model 109 shown in the illustration operates at 2500 rpm. Standard equipment includes $\frac{3}{16}$ " or $\frac{1}{4}$ " Jacobs chuck and 8' of $\frac{1}{4}$ " hose and fittings. Drills have built-in oilers; 4-bladed rotors; hardened and ground cylinders; 4-ball bearing construction.

(Continued on page 132)

FIRST REAL SIMPLIFICATION IN NULL-BALANCE INSTRUMENTS!

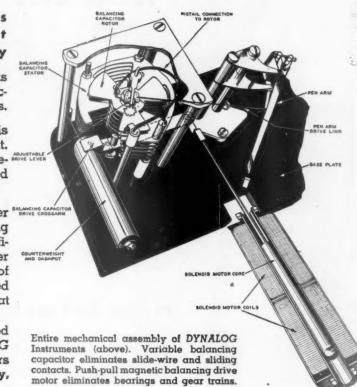
Only Foxboro's unique DYNALOG Instruments employ electronic principles throughout for new Simplicity, Speed and Sensitivity

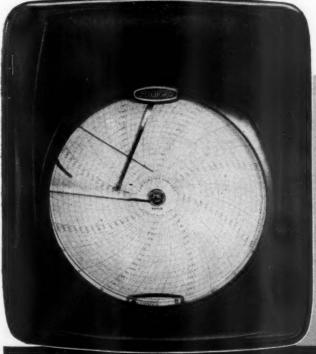
Here are the first industrial bridge-type instruments ever designed to realize fully the advantages of electronic balancing circuits and electronic mechanisms.

Mechanical Simplicity of DYNALOG Instruments is clearly shown by the compact assembly on the right. Containing only 5 moving parts, it completely re- DRIVELEVER places the usual galvanometer and complicated feeler-and-clutch mechanism.

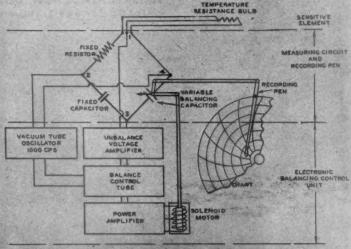
Performance of DYNALOG Instruments is higher BALANCE than ever available before: (1) dynamic balancing with full scale pen travel in only 3 seconds; (2) definite balancing action on unbalance voltages under 15 microvolts; (3) calibration accuracy 1/4 of 1% of scale span; (4) accurate recording of highly expanded scales; (5) continuous, high driving power, even at bridge null-point.

On any problem demanding such unprecedented performance, call in a Foxboro engineer. DYNALOG Temperature Recorders and Multiple-Point Indicators are available on AA1 rating. The Foxboro Company, 182 Neponset Avenue, Foxboro, Mass., U. S. A.





Schematic diagram of DYNALOG Recorder (below) shows electronic integration of measuring, balancing and recording functions. Bridge unbalance voltages are amplified up to 1,000,000 times to operate drive motor.



ELECTRONIC RO INSTRUMENTATION





... as these Quick and Easy-Driving AMERICAN PHILLIPS SCREWS"

Yes, it always boosts the morale of workers when they're freed from the slow, exhausting, dangerous work of hand-driving slotted screws . . . and switched onto the fast, effortless, safe method of powerdriving American Phillips Screws.

Output jumps to new highs. Accidents and rejects hit bottom. Total time-savings climb as bigh as 50%. For American Phillips Screws banish the fear of mistakes, instil new self-confidence, build pride in good work. In fact, good work is the only kind that can be done, with Ameri-

CHICAGO 11: 589 E. Illinois Street

can Phillips Screws. The recessed head stays straight on the 4-winged driver 'till the screw is turned up tight and flush. And this surety of operation means fairer return on fixed overhead . . . an advantage no shop, large or small, can afford to miss.

To these advantages are added other exclusive American advantages...the capacity of one of the largest U. S. screw plants...3-point inspection that checks every screw-head, thread, and point ..: and the ready advice, on any fastening job, of American's veteran corps of engineers:

AMERICAN SCREW COMPANY, PROVIDENCE 1, RHODE ISLAND **DETROIT 2: 502 Stephenson Building**

lake a Recess from Slotted-Screw Costs and Troubles

... the Tapered, Engineered Recess of:

AMERICAN ILLIPS Screws

PATENTS MAKE JOBS

ut the Screws on the Japs . . . BUY BONDS!

Th to fic

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The most modern heat-treating facilities are available at Kropp Forge for producing tough, heat-treated forgings to any specification. For annealing and normalizing, there are box, side-charged and car type furnaces in various sizes up to 40' in length. For drawing and quenching, pit-type furnaces of two designs provide definite advantages in the case of forgings which must meet severe or unusual requirements. Soaking and cooling pits for aging large forgings and shafts.

All heat-treating operations are under laboratory control. Machining, if desired, to users' specification.

We are daily producing large quantities of

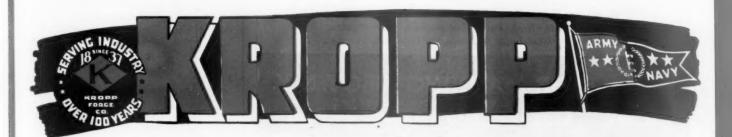
tough stress-resistant forgings including heattreated parts for ordnance, tanks, ships, planes, vehicles and ma-

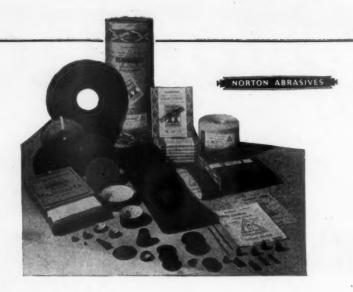
chine tools, in endless size and shape.

When you need flat die, drop or upset forgings, regardless of quantity, call the nearest Kropp engineering representative or send your blueprints direct for immediate quotation.

KROPP FORGE COMPANY (50)
5301 W. Roosevelt Road Chicago (50), Illinois

Engineering Representatives in Principal Cities





This New Mark means BETTER Metal Sanding



LONGER, COOLER CUTTING LIFE For Coated Abrasives

More resistant to heat . Less sensitive to humidity

DURABONDED is the result of Behr-Manning's new process for hardening the adhesive bond, to resist cutting heat, retard loading, repel humidity. Actual field reports on metal sanding operations using DURABONDED abrasives show a 25% average increase in cutting life—at no added cost. Have one of our Field Engineers show you how DURABONDED can help on your production.

Drop us a line on your letterhead, either to Troy or our nearest branch.

Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Grand Rapids, High Point, Indianapolis, Los Angeles, New York, Philadelphia, St. Louis, San Francisco, Tacoma



BEHR-MANNING · TROY, N.Y.

(DIVISION OF NORTON COMPANY)
RELIABLE COATED ABRASIVES SINCE 1872

FOUNTAIN MARKING PENCIL

FOUNTAIN
marking pencil
known as "Speed
Marker" has been
put on the market
by the Diagraph
Bradley Stencil
Machine Corp., St.
Louis, Mo., the tip
of which is constantly saturated



with ink due to a newly designed felt tip in which the ink penetrates from the inside out. The size of the pencil is approximately 77%" long with a 5%" diameter barrel. It is of reinforced aluminum construction. Manufacturer states there is no flooding, that no vacuum is created and that the pen marks clearly on any surface. Replacement tips are packaged six per box.

SAPPHIRE PLUG AND RING GAGES SAPPHIRE plug and ring gages are announced by the Sapphire Products Division of the Elgin National

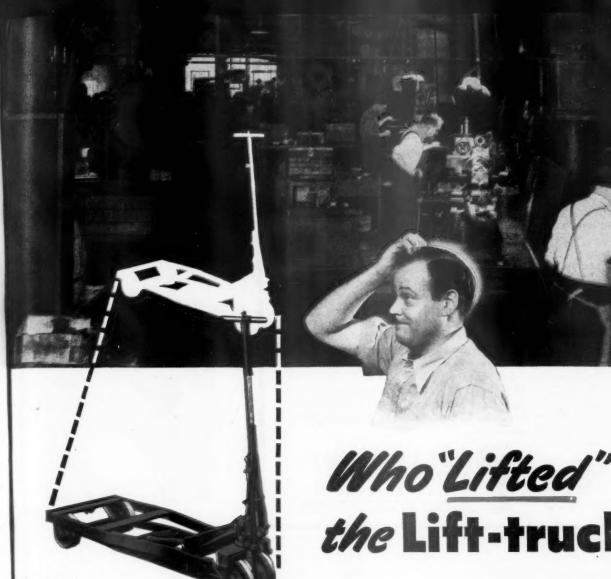
Watch Co., Aurora, III. Next to the diamond, sapphire is the hardest substance on the mineral hardness scale. Sapphire plug and ring gages can be ordered in the exact size needed with no wear allowance required. Sapphire is not affectedg by any chemical ordinarily encountered in gaging. The gages are said to be remarkably strong and to stand up well under ordinary shock of handling in use. Gagings as high as approximately 158,000 are reported, with wear of about 0.00001 inch, or well within tolerance. Ring gagings up to 172,000 are reported to show less than 30 millionths of an inch wear for a distance of ½4", and well within tolerances.

TWIN READER



ILLUSTRATION shows Twin Reader just put on the market by Edroy Products Co., 480 Lexington Ave., New York, N. Y. The unit is of the binocular type incorporating matched and balanced dual lenses. These are mounted in a holder that folds back into a plastic handle. It may be used in conjunction with corrective glasses. Initial production is in focal lengths from 8 to 14 inches from the eyes in three different powers of magnification.

(Continued on page 134)



Who Lifted" the Lift-truck?

HERE'S Bill with a load to move—and no way to move it! Who "lifted" the Lift-truck? Joe in the storeroom? Harry in the shipping room? No matter . . the point is this: Bill is forced to waste time looking for a time-saver!

Don't let this happen in your plant. Remember, the cost of another Lift-truck or two is nothing compared to the savings they effect. And they can be most effective only when there is always a Lift-truck where you want it when you want it.

Look around your plant. Are you getting the most out of your Barrett Lift-trucks and Skids . . . the greatest possible savings in time, money and man power? If not, contact your Barrett engineer today!

BARRETT-CRAVENS COMPANY

3280 West 30th Street Chicago 23, Illinois

Representatives in All Principal Cities Canadian Licensee: S. A. Armstrong, Ltd.



Have you received your free copy of the Barrett Junior Catalog?





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BARREL TRUCKS

NIFTY SYSTEMS



Quality

ADRESIVE TAPES
COMMINING
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WALLASTON, MASS.
S. B. Scott, 123 Eim St.
CAPE TOWN, S. A.
K. Stein Agency Co., 12 Plain St.

COATING LAMINATING QUICK SERVICE

A DHESIVE and chemical mix coatings expertly applied to paper, cloth, foils, and other materials.

Fabrics backed, laminated or combined to your specifications, and special purpose formulas developed in our own Laboratory.

65 years of "Know-How" deliver "Use-Proved" tapes and backings deserving the enthusiastic approval they earn on the production lines.

Just tell us what your problem is and let our Laboratory, backed by their years of specialized experience in synthetics, help you find the perfect solution.

help you find the perfect solution.

Let Mr. George L. Peters, E.M., Columbia 1911, head of our Engineering Staff, suggest from our formulas those experience indicates as best suited to your particular needs.

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You are Sure of the Best When You Select from a WYCO Catalog

There is a right machine for every job — WYCO Flexible Shaft Equipment includes a complete range of machines to meet every production requirement . . . with mountings to suit every working condition.

WYCO Flexible Shaft Machines have won national recognition for successful performance on the toughest jobs for war production... have set new records for longer shaft life and greater production per unit of power!

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WYZENBEEK & STAFF, INC.

847 West Hubbard Street

Chicago 22, Illinois



Selective Speeds 1800, 3600 or 6000 RPM. 1½ HP 3-phase motor and 7 ft. Shaft. Note low center of gravity — no danger of tipping over.

Only WYCO Flexible Shaft have this Patented Non-Metallic Innerliner — Makes the Core last longer . . . Run smoother . . . Transmit more power.

WYCO
FLEXIBLE SHAFT
EQUIPMENT and
PROFIT
PRODUCING
TOOLS

BELT UTILIZES STEEL CABLES A NEW "Compass 250" transmission belt which utilizes steel cables is announced by the Goodyear Tire

& Rubber Co., Akron, Ohio. The steel cables are encased in an envelope of non-load carrying fabric. They consist of a special twisted, finely stranded, high-tensile wire. Half the cables in a belt are twisted to the left and the other half to the right to insure a neutralized, truerunning belt. The belts are characterized as being "practically unbreakable." This is "because the cables are imbedded in rubber and encased in a fabric envelope and thus can receive no external, strength-reducing wear."

FOR HEAVY WELDMENTS



HEAVILY covered arc-welding electrode for flat and horizontal fillet welding as well as for flat butt welding is announced by the Electric Welding Divn. of the General Electric Co. Desirable wherever weld requirements include high mechanical properties, rigid X-ray examination, good profile, high deposition rate, and good surface appearance, the applications of the electrode include pressure vessels and pertinent connections, heavy machine bases, and structural parts such as column plates, columns, roof trusses, beams and girders where the thickness of the section permits. Known as Type W-27, the electrode is characterized by an exceptionally high melting rate. It has low spatter loss and easy slag removal. It is available in three sizes: $\frac{3}{16}$ by 18 inches, $\frac{1}{4}$ x 18, and $\frac{5}{16}$ x 18 inches, and is rated A.W.S. classes E6020 and E6030.

NEW TYPE OIL AND COOLANT STRAINER

NO strainer housing is required for new Metex strainer used on machine tools for straining cutting oils and

coolants and for other installations using flood oiling. Strainer is installed in the tank and the oil or coolant is piped direct from strainer to pump. Strainers have large strainage area; and exceptional capacity to hold dirt, grit and chips can be provided in larger units. Strainer units are replaceable. George Butler Co., 1054 West Washington Blvd., Chicago, Ill.

(Continued on page 136)

One thing seems reasonably clear about postwar expectations ...
the competition between products will reach new heights. Even
the smallest advantage may turn the tide. Possibly it might be a slight superiority
of a small part molded of rubber or synthetic . . . such as

we have produced for the Army and Navy . . . produced well enough to have earned five "E" awards. At any rate, all we know and all we

have will be completely at your command . . . when peace permits. Acushnet Process Company, New Bedford, Massachusetts,

Processors of Precision-Molded Rubber Goods.



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ROUND surface plate, measuring 102 inches in diameter, designed and built primarily for checking gun turrets, is announced by Machine Products Corp., Detroit 12, Mich. Plate weighs 2½ tons, and is approximately 18½" in depth, with rib construction. Plates are cast of Meehanite iron with the entire face precision scraped.

DUAL DIAMOND GRINDING WHEEL DUAL purpose super-cut Zurium bonded diamond wheel — which is two diamond wheels in one—for

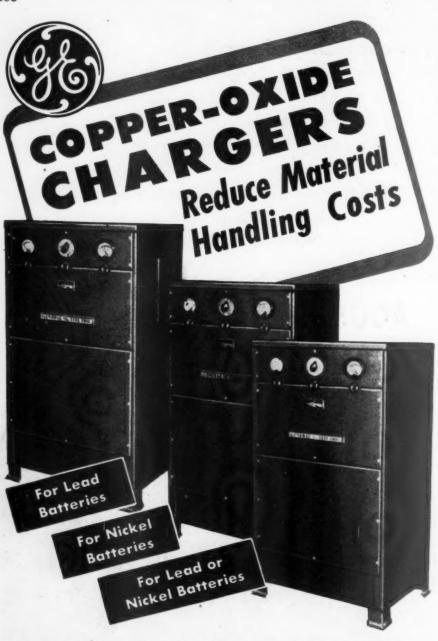
rough grinding and fine finishing of cutting tools, is announced by Industrial Abrasives, Inc., 3724 West 38th St., Chicago, Ill. Of the two separate grinding surfaces, the outer (7 deg.) beveled surface contains layers of coarse diamonds whereas the inner flat surface is built up of fine diamonds (400 mesh.) Manufacturer states that by angling the side or point of a carbide tool, it can be rough ground, and super fine finished in 6 seconds without the operator having to shift his position.

MULTIPLE GAGING INSTRUMENT



ILLUSTRATION shows multiple electric precision gaging instrument built for rapid checking of 21 outside diameters of a master camshaft, made by the Sheffield Corp., Dayton, Ohio. Each of the dimensions is indicated on the diagram panel by means of light signals and all are checked simultaneously in one quick operation. Lights remain off when the dimension is within tolerance limits. When bulb shows red, it indicates that the dimension is under the minimum tolerance limit, while a green light signifies that the dimension is larger than the maximum. Number of dimensions may vary from two to more than 20 depending upon the item to be checked.

(Continued on page 140)



G-E Copper-oxide Battery Chargers located in truck working areas save time, labor and battery power. They're designed to meet the exacting charging requirements of large industrial electric truck batteries as well as the smaller requirements of batteries used in motorized hand trucks.

Completely automatic, G-E Copper-oxide Chargers are easy and economical to operate. The truck driver sets a simple con-

trol and the charger "takes over." It delivers a charge then shuts itself off. They're low priced, flexible and require little maintenance.

For complete information, write to Section G452-57, Appliance and Merchandise Dept., Bridgeport, Conn. Ask for the new truck charger bulletin—publication No. 52-46.

BUY WAR BONDS AND KEEP THEM



GENERAL & ELECTRIC

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A SUCCESS STORY

When the war was very young, several important industrialists appealed to us for a saw that would cut aluminum and magnesium.

The DoALL Buttress was all ready—developed in our laboratory, the most modern in the world devoted to better contour sawing and finishing of every material.

The Buttress went right to work in plants making parts for planes, ships, P.T. boats, motors, jeeps, trucks, armaments, instruments.

Last summer it was released by the War Production Board.

Old-time saw men are still amazed at the performance and saw life of the DoALL Buttress, which requires no resharpening, but does continuous, good work until worn out. They won't believe the time saved by the Buttress when sawing not only non-ferrous metals, but plastics, laminates, plywood and lumber.

To convince yourself, order a try-out band today. Available at all our supply points. Mention the material you have to cut and you'll get the proper pitch and width saw.

Write for literature about the DoALL Buttress























DoALL

INDUSTRY'S NEW SET OF TOOLS

The DoALL Company

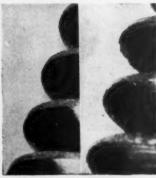
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Sales & Service Offices: Baltimore, Birmingham, Boston, Chicago, Cincinnati, Cleveland, Dallas, Dayton, Denver, Detroit, El Paso, Erie, Grand Rapids, Hartford, Houston, Indianapolis, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Orlando, Philadelphia, Pittsburgh, Providence, Reading, Rochester, Rockford, St. Louis, San Francisco, Seattle, Statesville, Syracuse, Toledo, Tulsa. PARKER-KALON

Presenta

Ground Thread

Unretouched photograph of Ground Threads



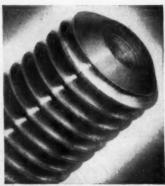
smooth, clean threads Compare the superb finish of ground threads (left), with the toolmarred surfaces of cut threads (right). Ground threads reduce friction, speed assembly.



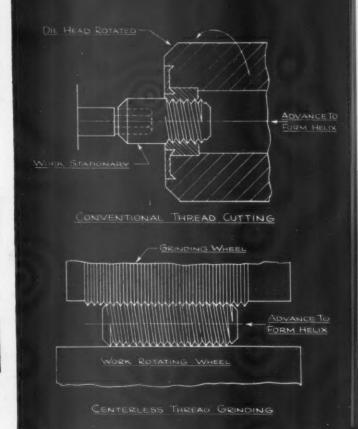
GUARANTEED CLASS 3 FIT Thread grinding by the new method makes sure of remarkable uniformity, assures fastenings of dependable security.



PERFECT THREAD CONTOUR AND LEAD The smooth surfaces and the accuracy of ground threads is immediately apparent in the comparator.



PERFECT STARTING THREAD The reason why P-K Ground Thread Set Screws start easier, and speed assemblies, may be easily seen in this closeup.



NO NI ING Ci

thread

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cut th

A revolutionary new process brings you socket set screws years ahead in quality . . . at no higher price!

UP TO NOW, thread grinding has been a process employed only for finishing screws used in the finest precision equipment. It remained for Parker-Kalon – cooperating with the Landis Tool Company – to adapt thread grinding to quantity production of socket set screws . . . the most important development since the advent of this type of screw.

P-K GROUND THREAD SET SCREWS are years ahead in appearance, precision, and performance. The smooth, clean, gleaming finish has none of the nicks, burrs, or tool marks common to ordinary set screws. By every dimension test, they excel any previous standard for accuracy.

ASSEMBLIES ARE MADE FASTER with these superior screws, because they are held to standards of accuracy heretofore unattainable on a production basis. FREE SAMPLES will be sent at your request. Write now. Examine these finer Set Screws... you'll find it hard to believe they cost no more! Parker-Kalon Corporation, 202-204 Varick Street, New York 14, N. Y.

WHEN YOU CAN OBTAIN THESE NEW GROUND THREAD SET SCREWS . . .

Present facilities are too limited to permit the building of adequate stocks. Therefore, orders cannot be filled at this time. As soon as additional equipment is put into production we will be in a position to take care of demands through our distributors. Meanwhile, free samples are available.

A PRODUCT OF PARKER-KALON
SPECIALISTS IN FASTENING DEVICES

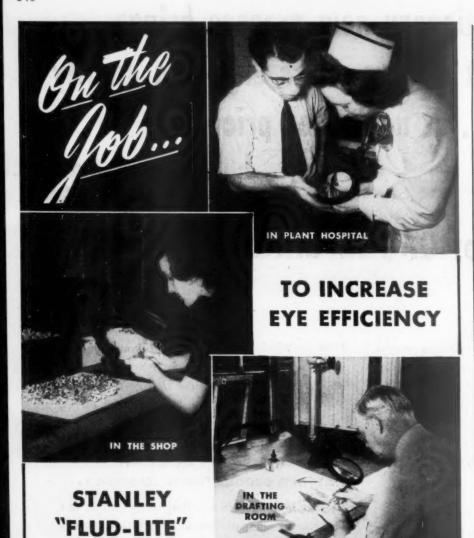


NO NICKS, NO BURRS, NO HARDEN-ING CRACKS Threads are ground on a hardened blank, increasing thread strength, and preventing the imperfections common to cut threads,



The years-ahead quality of the P-K Ground Thread Set Screw is apparent at a glance... proves out in performance.





In shop, engineering department, or dispensary, the high visibility performance of Stanley "Flud-Lite" Magnifiers saves errors, time, trouble. They raise eye-efficiency by (1) floodlighting the work with shadow-free fluorescent light, and (2) magnifying the work through a high-quality 5-inch lens. For super-magnification, the Stanley Auxiliary Lens, $2\frac{1}{2}$ -inch, is easily attached. Check your needs and write today for illustrated folder. Stanley Electric Tools, Division of The Stanley Works, New Britain, Connecticut.



MAGNIFIERS





STANLEY ELECTRIC TOOLS

HI-BOND FLUX FOR TINNING CAST IRON

A FLUX designed to promote uniformly tinning of cast iron prior to brazing, has been developed by Air

Reduction Co., 60 East 42 St., New York, N. Y. The manufacturer states that this flux overcomes the difficulties encountered in tinning cast iron due to its graphitic nature and makes possible satisfactory tinning of cast iron especially of high carbon and silicon content or low combined carbon analysis. It does not take the place of the regular flux used for the actual brazing operation. It may be applied as a water-mixed paste or as a powder sprinkled on the surface, heated to the required temperature. Packed in 1-lb. containers. Literature available.

SMALL PLASTIC COATER



TWO new small plastic coaters have been designed by the Youngstown Miller Company, Sandusky, Ohio. They are designed to coat small tools or parts prior to shipment or to protect precision cutting tools and gauges kept in storage before being used. Small units have the same features of the large ones. Model 3-8 has a capacity to melt from 3 to 5 pounds of plastic per hour with a dip compartment 6" wide by 9" long and 6" deep. Model is the same with dip tank 3" deep. Model 5-8 will melt from 5 to 7 pounds per hour and has a dip compartment 9" wide by 12" long and 6" deep. Model 5-15 has a dip tank 13" deep.

LINN HALFTRAK & LINN CATRUK THESE hard duty vehicles for all types of off-thehighway service, are illustrated and described in a new

bulletin just issued by the Linn Manufacturing Corp., Morris, N. Y. Types shown include Linns with various types of bodies for moving rock, coal and ore; side tipping dump body; Linn pole trailer with log bunks for logging, snow plow mounting. The Catruk models, which are equipped with four wheels and tracks, permit operation as a truck or half-track, according to ground conditions. The rear wheels are hydraulically retractable. They are for moving loads from 5 to 50 tons, where grades, deep mud, snow and ice, sand and rocks make negotiation with wheeled vehicles impractical.

(Continued on page 142)

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WHEN FIRES GET TOUGH KIDDE EQUIPMENT GETS TOUGHER!

HEN tough fires spring up—the fast-moving ones that break out in flam-mable liquids (Class B); the hard-to-get-at kind that start in electrical equipment (Class C)—the Kidde portable or hose reel system acts fast to knock them down—and out!

Ordinary water-type extinguishers can't control these tough fires. But the Kidde portable shoots out a cloud of carbon dioxide gas, forming a heavy blanket that smothers the flames. Then the dry, inert, non-toxic gas merely evaporates...leaving valuable liquids uncontaminated, electrical equipment undamaged. This Kidde method is recognized as one of the speediest, cleanest and safest fire-fighters in use today.

It's smart to check on tough fire areas in your own plant. Does the accompanying list of typical hazards suggest places that still need safeguarding? If it does, call in a Kidde representative—you'll find him wise when it comes to fire protection. Drop us a line.

Kidde Kills Tough Fires

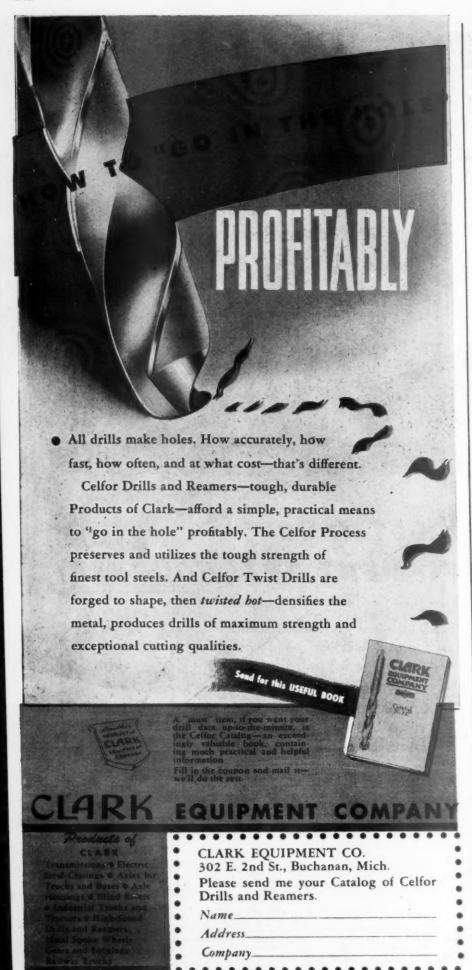
PROCESS ROOMS
OVENS
SPREADERS
MOTORS
STORAGE ROOMS
MIXERS
COATERS
TRANSFORMERS
DIP TANKS
AGITATORS
WASHING TRAYS
CONTROL PANELS

The word "Kidde" and the Kidde seal are trade-

marks of Walter Kidde & Company, Inc.

(idde

APRIL,



POWDERED METAL BRIQUET PRESS -

HYDRAULIC press for briquetting parts from powdered metal is announced by The Watson - Stillman

Co., Roselle, N. J. It is designed to simplify powdered metal molding, and to give high degree of accuracy and consisently uniform structure density in finished parts. Press has 400-ton capacity vertical ram and a 300-ton capacity horizontal ram. Mold size is 6" wide by 7" deep by 30" long. Press is 11' 6½" in height overall, and occupies floor space 6' 2" by 2' 7". Weight is approximately 28,000 lbs.

SPEED INDICATOR



electric speed indicator which is claimed to give accurate readings of speeds from 100 rpm to 5000 rpm, is being introduced by The Reliance Electric & Engineering Co., Cleveland, Ohio. It consists of two units. The pick-up unit, a miniature six-pole alternator with a permanent magnet rotor is mounted on the shaft whose speed is to be measured. The indicator, a permanent magnet, moving coil type, meters the pick-up output on a 33/4" scale which covers 95° of arc. Indicators are provided for full-scale deflection corresponding to 1500, 2000, 2500, 3000, and 5000 rpm. Special scales are available for reading in feet per minute, and process cycles of varying time.

STANDARD PACKAGING OF CARBIDE TOOLS

STANDARD-IZED stock packaging program for its standard Carboloy cemented carbide tools and

blanks, is announced by Carboloy Co., Inc., Detroit 32, Mich. Quantities of tools or blanks per package have been selected according to the quantities or multiples of the quantities of each item most frequently purchased. Turning, facing, and boring tools are packaged in lots of 12, 6, or 1; standard blanks for these tools in lots of 100, 50, 25, or 10; round boring tools are packaged in lots of 12 or 6; blanks for boring tools in lots of 100, 50 or 25; standard reamer blanks in lots of 100 or 50; scraper blanks in boxes of 25; pointed nose blanks in lots of 100, 50, or 25; and lathe and grinder center tips in lots of 50, 25 or 10. Identification is by colored labels.

(Continued on page 146)

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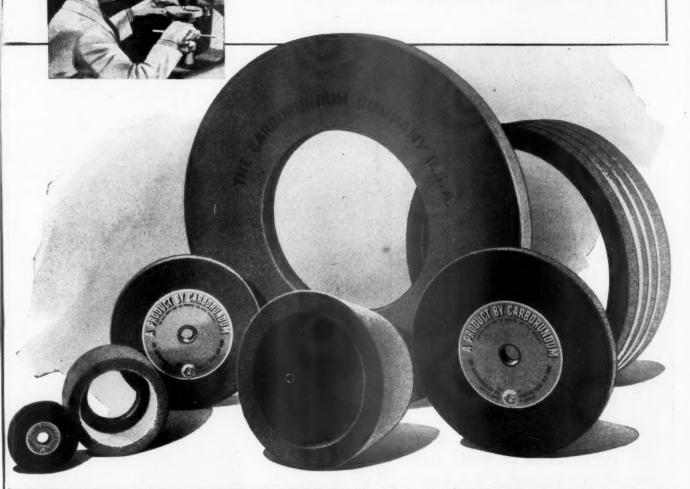
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consistent testing consistent trouble saves you trouble

BY subjecting every product to a series of tests before it leaves its factory, "CARBORUNDUM" saves industry an untold amount of grief. Uniformity of the abrasive means uniform wheel performance. Absence of flaws reduces down time in your shop. And these checks assure you that each product by "CARBORUNDUM" is the type of dependable abrasive tool you need for your job.

But there is still more involved in the production of good grinding wheels, coated abrasives and special products. It is equally important to get the particular abrasive combination best suited to the job. Your "CARBORUNDUM" Representative is the man to help you do that. And his efforts are supplemented by the knowledge of the "CARBORUNDUM" Abrasive Engineers. These are the men who have helped perfect a large share of the abrasive processes which have become standard. The Carborundum Company, Niagara Falls, New York.



CARBORUNDUM

FOR EVERY ABRASIVE APPLICATION

("CARBORUNDUM" is a registered trade mark of and indicates manufacture by The Carborundum Company)

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APRIL.



Measures accurately wall thickness of tubing, diameters of shafts and oddshaped parts, thickness of sheet metal and other materials.

Large pointer makes one complete revolution for each inch of jaw opening. Small pointer shows number of turns made by large pointer—or a total of 5 inches—jaw depth is 8 inches. Jaws close by spring tension.

All outside parts chromium-plated or made from stainless steel. No exposed gears. Accurate, durable and dependable.

New Catalog — No. 53
Send for your copy.

0

B. C. AMES CO. . WALTHAM, MASS., U. S. A.

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Branch Offices: 917 New Center Bldg., Detroit 2, Mich., • 420 Lexington Ave., New York, 17, N. Y.

SING

NOTHING WRONG WITH "REJECTED" PARTS? SOLVES GAGING MYSTERY

SHOW HOW REPORT

Customer ordered six 1/2-20 "Go" plug thread gages made to "X" pitch diameter tolerances. Three of them were assigned to machine operators as working gages and three to inspection department for final inspection.





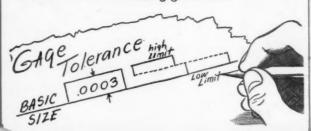
2 At tapping job the machine operators used working gages to check each part before they went on to next operation.

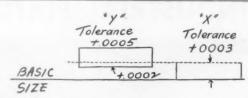
3 But at the final inspection of part, a large proportion of pieces failed to pass "Go" plug gage. Why? Actual measurement of rejected parts showed them to be "OK". Something was wrong. A hurry call was put in for "Greenfield Man".



4 On arrival at plant, "Greenfield Man" first had all six gages measured in customer's own inspection department, and found them all within tolerance.

5 "I'll show you what happened," said "The Greenfield Man". "Although all six gages were within specified limits, some were on the 'high side' and some on 'low side'. Thus high limit gages failed to enter where low limit gages would.'





6 He then showed how this problem could be remedied by: 1. Measuring all gages and distributing those that tended to the "high limit" to machine operators and those tending to the "low limit" to the inspection department. 2. By ordering "Y" tolerance for working gages, and "X" tolerance for inspection gages.



(1) Customer learned that trouble was not with gages he ordered, but with their application to the job. (2) Was

able to establish proper gage ordering and handling procedures.

"Greenfield" SHOW-HOW is KNOW-HOW in action! ON THREADING PROBLEMS SIMPLY CALL YOUR "GREENFIELD

MAN" THROUGH YOUR "GREENFIELD" DISTRIBUTOR!



GREENFIELD TAP and DIE CORPORATION

QUICKLY AVAILABLE AT A STOCK POINT NEAR YOU!



Armour's 332 stock points mean fast, dependable service for your present and future glycerine needs.

CHEMICALLY PURE or U. S. P. . . . A high grade, water-white glycerine meeting the requirements of the United States Pharmacopoeia. Suitable for use in foods, pharmaceuticals, cosmetics or for any

purpose demanding highest quality. Specific gravity is 1.249- 25°C./25°C.

HIGH GRAVITY ... A pale yellow glycerine for industrial purposes with a specific gravity of 1.262- 15.5°C./15.5°C.

DYNAMITE... A yellow glycerine made especially for the explosives trade. It has a specific gravity of 1.262- 15.5°C./15.5°C.

YELLOW DISTILLED . . . A yellow glycerine for industrial purposes with a specific gravity of 1.259- 15.5°C./15.5°C.

ARMOUR AND COMPANY 1355 WEST 31ST STREET

*COLOVOLT COLD CATHODE INDUSTRIAL FIXTURES



Here is the new Colovolt industrial fixture, one of a complete line of industrial and commercial "packaged" units. Equipped with the standard 93" Colovolt 10,000 hour lamp, Colovolt fixtures may be used singly or in continuous line lighting in multiples of 8 feet. Instantaneous starting, no flickering, guaranteed for 1 year except for failure due to breakage are extra advantages of the Colovolt Cold Cathode low voltage fluorescent lamp. The long life expectancy of Colovolt lamps may be realized even when constantly turned on and off, and pre-scheduled re-lamping, with no loss of production or time, is now possible with Colovolt installations.

*Trade mark regis-tered U. S. Pat. Off.

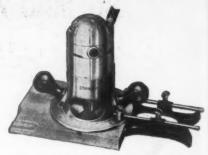
Contact your electrical wholesaler or jobber, or write us for full details and prices.

GENERAL LUMINESCENT CORPORATION

656 5. FEDERAL STREET

CHICAGO 5. ILLINOIS

IMPROVED HAND ROUTER



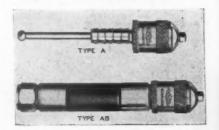
IMPROVED hand router 10A routing, relief work, carving, inlays, and which with attachments can be used for dovetails, beading and fluting, templet work and for many shaping operations, is announced by Stanley Electric Tools, New Britain, Conn. Motor is universal, 3/8 hp, with speed of 18,000 rpm. Features include a push button shaft lock for changing bits or cutters, or for removing or replacing chuck or shaper spindle.

100 AMPERE DE-ION CIRCUIT BREAKER

NEW 100-ampere "De-ion" circuit breaker which requires less space and permits lighter structure for dis-

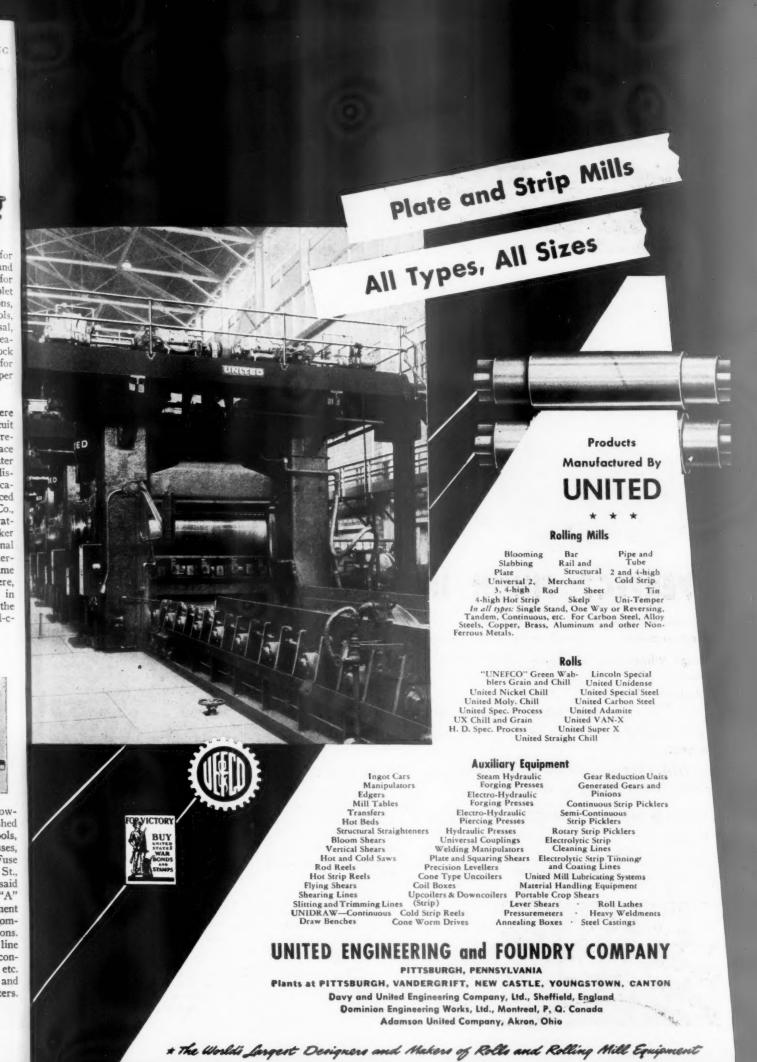
tribution panelboards, built-in applications and bus duct plug-ins, is announced by Westinghouse Electric & Mfg. Co., P. O. Box 868, Pittsburgh, Pa. All ratings are available in one compact breaker with uniform pole spacings and terminal arrangement, providing complete interchangeability between ratings. F Frame permits for the first time a 100-ampere, 600 volt a-c- or 250-volt d-c breaker in the same space formerly required by the 50-ampere, 600-volt a-c- or 250-volt d-c-

LEAK-PROOF AIR GUNS



LINE of leakproof air guns for blowing chips, dust, dirt, kicking out finished parts, and operating air driven tools, such as air vises, clamps, chucks presses, etc., is announced by the Trico Fuse Manufacturing Co., 2948 North 5th St., Milwaukee 12, Wis. Operation is said to be instant and positive. The type "A" is the most popular style for permanent applications. The type "AB" is recommended for remote control applications. It is attached directly to the air pipe line and operated by hand, knee or foot control, treadle, pulleys, cams, plungers, etc. Guns are available in three styles and for complete range of hose diameters. Printed matter available.

(Continued on page 148)



APRI



Whatever you have to finish - metals, alloys, plastics, wood, laminates or composition materials - you can do it better with Chicago Wheels.

Chicago Wheels have kept pace with the precision requirements of our war industries, and you can use them with confidence to finish civilian goods better in double quick time.

CHICAGO GRINDING WHEELS

A wide range of grains and grades and — for the duration — sizes up to 3" in diameter.

TRY ONE FREE — We'll send without charge a Mounted Wheel or an FV Bond Grinding Wheel. Tell us size you'd like.

CHICAGO MOUNTED WHEELS



The first made and the finest today. In a selection of bonds, abrasives and shapes to handle each job more



Write for Catalog listing all Chicago products and showing comparative photographs of finishes with different kinds of wheels

CHICAGO WHEEL & MFG. CO.

Headquarters for Mounted Wheels and Small Grinding Wheels

1101 W. Monroe St., Dept. PG, Chicago 7, III.

* Half a Century of Specialization has established our Reputation as the Small Wheel People of the Abrasive Industry.

Send Catalog. Intereste		G11
☐ Mounted Wheels.	Grinding Whe	els
☐ Send Test Wheel. S	ize	
Name		
Address		

LIGHTWEIGHT WATERPROOF PACKAGING MATERIAL

"VITAFILM" is the name of new lightweight, waterproof packaging and fabricating material which also

can be woven into fabrics, recently announced by the Goodyear Tire & Rubber Co., Akron, Ohio. It is a polyvinyl chloride product. In the six gauges of sheet form in which it is being produced it is adapted for food bags, bowl covers, garment bags and other uses. sealed or stitched it is suitable for umbrellas, raincoats and similar products. For woven fabrics Vitafilm is cut into thin strips which are stretched and twisted into thread for the looms after which it is woven like any other fabric material such as cotton or rayon.

CLAMPING JIG



ILLUSTRATION shows "Cone-Lok" clamping jig, new product of the N. A. Woodworth Co., 1300 E. Nine Mile Road, Detroit, Mich. It utilizes the braking power of perfectly mated male and female cones, and has a minimum of wearing parts. It can be converted from right to left hand operation in two minutes. No movement of working parts is possible without action of the operating lever. Three styles are now available: the three-post, the "up clamp", and the "bridge" type. The three-post may be used for most applications found in general machine shop work; up-clamp type is used where depth of counterbore or drilled holes must be held to close tolerances; bridge type is necessary wherever large heavy operations must be performed.

MAGNET PICKS UP SCRAP METAL

SWEEPING magnet for use inside or outside of factory areas, parking lots and similar places where scrap

metal may be a costly hazard for rubber tired vehicles, has been announced by Stearns Magnetic Mfg. Co., Milwaukee, Wis. This unit consists of a drum with 18" working face, permanently magnetized, doing away with energizing cables, and mounted on a chassis much the same as a lawn mower. The accumulated scrap is picked up by the magnetic drum and deposited in a tray back of the drum, which can be emptied. The handle is designed to allow pulling or pushing the vehicle, whichever is convenient for the type of surface being cleaned of metallic refuse.

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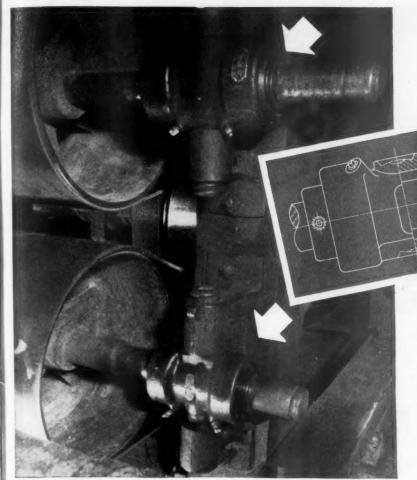
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FAFNIR TYPE F DOUBLE HANGER BOXES

Two Fafnir Wide Inner Ring Ball Bearings are used in this unit. No internal adjustments are needed because there are no sleeves or adapters. The Hanger Box is mounted simply by sliding the box and two self-locking collars over the shaft and tightening the collars. Standard pipe plugs allow use of any type grease appliance. Dust seals are available, if needed.

FAFNIRS SUPPLANT OLD TOMATO CAN SYSTEM

Nineteen years (52,500 bours) of carefree bearings operation after almost bourly worry over babbitted bearings . . . that's what Fafnir Heavy Duty Bearings brought to the superintendent of a cotton oil mill.

"In spite of keeping two perforated tomato cans of oil dripping on each babbitted ring-oil bearing," wrote this mill superintendent, "those old bearings were smoking most of the time."

Back in 1925, he replaced those four trouble-making babbitted bearings with Fafnir Type F Double Hanger Boxes. "They are still in use," he continued, "rendering the same good service they did when they were first put in . . . in spite of the load under which they have run." (The reverse drive and belt of the drive assembly in which these Fafnir Hanger Boxes were installed has a

known load of 130 horsepower, with a shaft speed of 477 r.p.m.)

Your first step in ridding your plant of old-type bearing delays, trouble and expense is to get in touch with your nearby Fafnir distributor. He will be glad to recommend the Fafnir Ball Bearings suited to your needs. The Fafnir Bearing Company, New Britain, Connecticut.



FAFNIR BALL BEARINGS

APR



THE RIGID METALLURGICAL AND MANUFACTURING CONTROL OF

BUCKEYE BEARINGS

Assures thorough dispersement of all component motals and freedom from porosity resulting in unsurpassed serviceability

• Manufactured from selected metals under Buckeye's complete laboratory control of charging ratios and melting and pouring temperatures, assures the production of a uniformly high quality of product, each piece of which, month after month measures up fully to Buckeye's exacting specifications.

For easy assembly and long efficient satisfactory service, specify Buckeye bearings by brand name. They are furnished fully finished in 1088 ready-to-use stock sizes—in cored and solid 13" bars—in several graphited styles—and in any OD, ID and length, slotted, split, drilled or flanged, exactly to customer's blue-print. No order is too big or too small for Buckeye.

Let us quote on your requirements.

Buckeye

BRASS AND MANUFACTURING COMPANY

BRONZESMITHS

6412 HAWTHORNE AVE.

SINCE 1900

CLEVELAND, OHIO

BRONZE SLEEVE BEARINGS · STANDARD SIZES OR TO CUSTOMERS' BLUEPRINT
IN ANY RECOGNIZED BEARING METAL ANALYSIS

COLOR



What will you GAIN by using it?

What will you LOSE by using it?

This down-to-earth booklet will help you decide for yourself!

THERE'S a lot of discussion going on these days over the idea of using more color in the industrial plant.

We're all for it if it's used in the right places. But if you've been tempted to go "all out" for color on such important light-reflecting surfaces as the ceilings and walls of your plant, it will pay you to stop and ask yourself these three fundamental questions:

- 1. What are we painting for?
- 2. What will we GAIN by using color?
- 3. What will we LOSE by using color?

With the help of some of America's top ranking light and color authorities, we have prepared expressly for industrial plant executives a little 16-page booklet which we believe will help you arrive at the answers to these three questions. Entitled "Color for Industry," this booklet covers the use of color for every plant area and surface and outlines a simple but effective plan for the promotion of plant safety through the use of color.

USE THIS COUPON

To help save paper for Uncle Sam we are limiting distribution of "Color for Industry" to executives who specifically request a copy. To avoid disappointment, fill out and mail this coupon TODAY.



U. S. GUTTA PERCHA PAINT COMPANY
'8-D Dudley Street, Providence 1, Rhode Island

Please send me, without charge or obligation a copy of your booklet, "Color for Industry."

PIRM.....

ADDRESS.

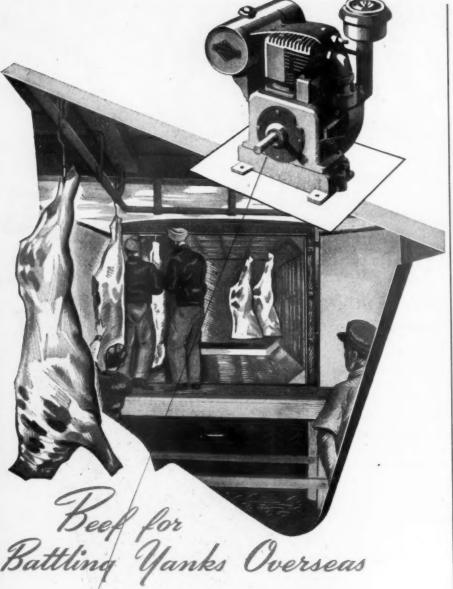
STATE

ATTENTION MR.....

TITLE...



Specialists for Nearly Fifty Years in Maintenance Paints for Industry



Red meat — beef — and other perishable foods for our red-blooded, hard fighting Yanks are rushed to them in refrigerated trucks from supply depots.

Refrigeration units are powered by performance-proved air-cooled gasoline engines — one more of many war uses for dependable, instant-starting

Briggs & Stratton engines.

Air-Cooled Power



The performance records established by more than two million Briggs & Stratton engines are conclusive proof of their perfection in design, their fine engineering, and precision manufacture. Current models, and those to come, are backed by the "know how" gained through 25 years of continuous production of AIR-COOLED Gasoline Engines.

BRIGGS & STRATTON CORP., Milwaukee 1, Wis., U. S. A.

SYLVANIA ANNOUNCES NEW FLUORESCENT LAMPS

New fluorescent lamps providing instant starting, higher efficiencies, and simplified installation and maintenance are announced by Sylvania Electric Products, Inc. of Salem, Mass. They will be supplied in smaller diameters and new standard lengths up to 96".



The new LS Type of Fluorescent Lamp.

Operating without starters these lamps, designated as LS Types, may also be operated in series on a single ballast at 100 or 200 milliamperes or at other currents within this range to provide high lighting levels or lower intensities for many industrial and commercial installations, including hallways, showcases, and railway cars.

The elimination of starters simplifies maintenance. Life of Type LS fluorescent lamps at 200-milliampere operation is expected to be comparable to that of 40-watt standard fluorescent lamps. Definite ratings will be published as soon as life testing is conclusive. Their efficiency, as high as 65 lumens per watt, is considerably higher than previous types. General specifications of Type LS fluorescent lamps are as follows:

lamps are a	is lullows.	
Type LS	Current	Approximate
Lamp Size	Milliamperes	Lumens
42" T6	100	900
	200	1400
64" T6	100	1400
	200	2150
72" T8	100	1400
	200	2350
96" T8	100	1950
	200	3300

These Type LS fluorescent lamps, equipped with single contact bases, are available in 3500° white. Ballasts and accessory equipment will be available through regular trade channels as soon as wartime limitations permit.

Also announced by Sylvania is a new 13-watt miniature lamp, in white or daylight, 21" long and 5%" in diameter. Approximate initial lumens are 580 for the

(Continued on page 154)

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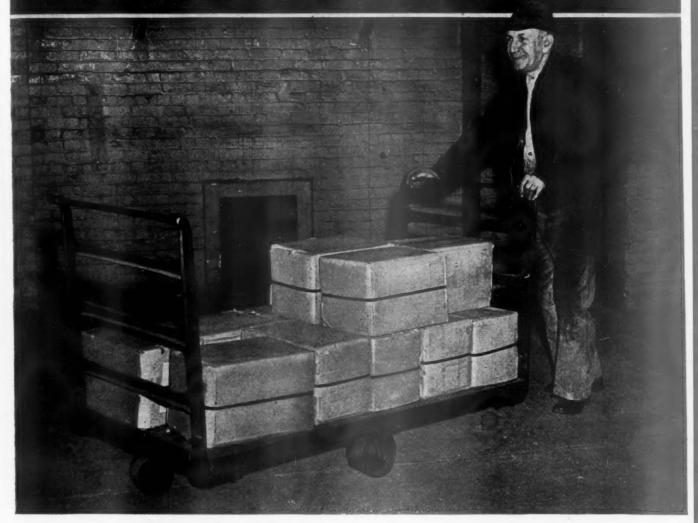
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American industry rolls on fairbanks trucks



Work Expediter on wheels

Because it handles so easily, steers so simply and quickly in narrow aisles, on busy shipping platforms, through congested warehouse traffic . . . because it's built to take all the bruising punishment demanded by month after month and year after year of war-urgent freight schedules . . . this Fairbanks Commander Platform Truck is not only a work-expediter but a work-horse, too.

With its well-balanced design and sturdy running gear, it makes heavy loads lighter for veteran operators. With its steel-bound hardwood platform, it resists the slambang handling of green help... stands up successfully against the jolts and shocks of war-worn plant flooring.

The Commander is a leader in the well-known, timetested, ever-evolving line of Fairbanks products for better load handling. Among the Fairbanks trucks built to achieve the triple combination of strength, simplicity and long life, are units serving many manufacturing operations as well as shipping departments.

Catalog No. 50 describes and illustrates many of them. Send for your copy, and if you don't find what you want, write and tell us what your problems are. Chances are we can help you, drawing on our experience in making hundreds of thousands of trucks now in use.



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Point the Way to Relieving Your Troubles on

SPECIAL WASHERS AND SMALL STAMPINGS

• Twenty-five years of specializing in the production of Special Washers and Small Stampings make it easy for us to solve your problems in this field. More than 10,000 sets of tools are ready to produce the washers and stampings you desire. Our expert Tool and Die Department is also ready to help-if none of the present sets of tools can give you what you want.

Special Washers and Small Stampings are available from steel, brass, copper and other metals. Just send your blueprints or specifications to us.

Also a full line of Standard Washers in kegs or cartons.

U. S. S. Washers . S. A. E. Washers Riveting Burrs • Square Washers **Expansion Plugs • Aircraft Washers**

Machinery Bushings • Discs Light Steel Washers • Copper Washers **Brass Washers • Aluminum Washers** Stainless Steel Washers . Etc.

THE MASTER PRODUCTS COMPANY

6400 PARK AVE. . CLEVELAND 5, OHIO

(Continued from page 152)

white and 490 for the daylight. This lamp is of the conventional two-prong, starter type but will require a new ballast for its

POWER BRUSH BURRING OF STEEL PIPE

Burring the ends of steel pipe by power brushing is faster and the burrs are more completely removed, leaving a uniform radius all around the pipe, according to a large Connecticut manufacturer now employing this method in place of filing or grinding.



This type of disc-centered "Master Wire Wheel" brush is now being used as a faster method of burring the ends of steel pipes.

The equipment being used is an Osborn "Master Wire Wheel" 8 inches in diameter, with a 1½-inch brush face of .014 wire. (See Fig. 1.) It is mounted on a bench motor and the pipes are placed in a rack with pin guides to maintain the proper brushing angle (90 degrees from shaft line) and are turned by hand while in contact with the brush. (See Fig. 2.) The motor turns the brush at the rate of 3500 revolutions per minute.

The use of power brushes in this operation makes it possible to burr both ends of a steel pipe in ten seconds. The time consumed for the same operation by filing or grinding varied but was considerably greater in most instances, according to information received by the Osborn Manufacturing Co. of Cleveland, O., world's largest producer of power brushes.

The power brush burring method is applicable to most types of steel pipe.

NEW PLASTIC-DERIVED FABRIC

Disclosure of an unusual type of plastic-derived fabric which resists flame and which can be cleaned readily by wiping it with a damp cloth is arranged by the Goodyear Tire & Rubber Company's new

Research Laboratory, Akron, Ohio. A. F. Landefeld, Manager of Goodyear's Pliofilm Department, said the fabric is well adapted to auto seat covers. wall coverings, tapestries.

Other potential uses, he said, include luggage, ladies' hand bags, and light, colorful, easily-cleaned uppers for men's and women's shoes. Volume production of the fabric awaits the end of the war, al-

(Continued on page 158)

NEW! Takes but a second to close or open! GRAND QUIKCET

CHECK THESE FEATURES

Instant Ratchet Screw Closing. Opens in-stantly with Trigger Rease. No wasted time run

Balanced Precision Grip at all points. integral with body aw plates to come loose

Multiple Strength Alloy-Steel extra thick wall body construction. VAnvil top. Bottom screw clamp for quic shifting of vise.

QUIKCET VISE can and tighten with turn of handle. Bone Grip holds firmly.

OPENS INSTANTLY to full 3 inches by trigger release. Ready for further work with-out adjustment.







Prompt Shipment on Priority Orders.

Write for Complete Catalog of Speed Clamps and

GRAND SPECIALTIES COMPANY 3115 W. Grand Ave. . Chicago 22, Illinois

A PROVED SURFACE GRINDING ARDSTICK

If you are feeling your way on some surfacing operation . . . seeking a wheel of the grain, grade and structure that will do the job as your "spec" requires—use the 846 K-1-V Dayton as your "yardstick".

You may find, as so many have found, that it's exactly the wheel you are looking for, If not, you will find it at least surprisingly "close" to what you've got to have. So close, in fact, that selection of the correct wheel can then be made without further experimentation.

To save time, money, worry-put this 846 K-1-V Dayton to the test now. Made in a wide range of sizes—with trial wheels shipped from stock.

WIRE, WRITE OR PHONE TODAY

SIMONDS WORDEN WHITE CO. 700 NEGLEY PLACE, DAYTON 7, OHIO



Tap users who haven't tried COLD-TEMPER Taps are apt to have the notion that cold-tempering provides only a surface or "skin" hardening effect that disappears as soon as the tap gets its first sharpening.

Actual performance proves that Threadwell cold-tempering at 120° below zero improves the metal structure of the tap through and through yet makes it actually less brittle than high speed taps having only the usual heat treatment. Threadwell Cold-Temper Taps cut better threads and keep on cutting them longer, both before and after each sharpening. Tap life is definitely increased.

Don't take our word for it. The "proof of the pudding is in the eating". Try Threadwell Cold-Temper Taps on steels, cast iron, alloys, plastics, whatever production tapping you may have that will put them to the sternest test.

Threadwell Cold-Temper Taps cost no more. All you need to do is ask your local Threadwell Distributor to make your next lot of high speed taps, COLD-TEMPER Taps.

DISTRIBUTORS IN LEADING INDUSTRIAL CENTERS THROUGHOUT AMERICA

EXPORT STOCKING DISTRIBUTORS

CANADA, Bridge Machinery Co., Montreal; ENGLAND, Skylux Ltd., London and John H. Graham and Co., Inc. THROUGHOUT THE WORLD

Threadwell OF DISTINCTION"

THREADWELL TAP AND DIE COMPANY - GREENFIELD, MASSACHUSETTS, U. S. A.







Ever have a brass headache?





When a long-haul shipment or needed technical data is slow in coming, production suffers - and so does the purchasing agent. If the purchase or use of brass is sometimes a headache, call the nearest Chase Warehouse or Sales Office. Wherever you are, whatever the brass problem—delivery or application—Chase coast-to-coast service may save you time, production delay, and headaches.

You may find it helpful to have our new book, "Chase Free-Cutting Brass, Bronze & Copper." For a complimentary copy, address Dept. P-4.



Remember-chase service is as close as your phone



Waterbury 91, Connecticut

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

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MINNEAPOLIS NEWARK NEW ORLEANS NEW YORK

PHILADELPHIA PITTSBURGH PROVIDENCE ROCHESTER +

SAN FRANCISCO SEATTLE ST. LOUIS WASHINGTON T † Indicates Sales Office Only

This is the Chase Network - handiest way to buy brass

MEAT SAVER!

Here's another Dayton V-Belt doing a tremendously important job. Dayton V-Belts are safeguarding four huge boxes of beef, pork and other precious foodstuffs! And it's a continuous, 7-day-a-week job!

Utterly dependable, Dayton V-Belt drives provide smooth-flowing, positive power transmission—from fractional to a thousand horsepower.

Other plus advantages are: Dayton V-Belts provide better grip—prevent wasteful loss of power. Then, too, full power is transmitted with less belt-tension—to give longer bearing life. Shorter centers mean valuable savings in floor space, too!

To get all these important savings—call your Dayton V-Belt Distributor.

Here are Dayton's three exclusive advantages:

- 1. Dayton Rubber, as the World's Largest Manufacturer of V-Belts, offers you vast experience in Power Transmission Engineering.
- 2. This experience is made available to you through trained specialists in your Dayton V-Belt Distributor's Organization.
- The technical excellence of Dayton Rubber gives you V-Belts pronounced unsurpassed both in mechanically correct design and in quality of construction.

Call your Dayton V-Belt Distributor! Ask how Dayton Power Transmission Engineering can help you.

THE DAYTON RUBBER MANUFACTURING COMPANY
DAYTON 1, ONIO

The World's Largest Manufacturer of V-Belts



Dayton ELBER AFG. CO.
RIGHTAN HUBBER AFG. CO.
Rulb lb e 17



Greater Gripping Power—maintains

ice Only

compression at rated capacity
 Less Belt Tension—saves bearings
 Short Centers—save floor space



Ask yourself if the blueprints and specifications cover everything. For instance, do they cover . . .

- 1. Engineering Co-operation: Production planning that looks behind blueprints and examines function. Corbin engineers have often suggested changes and combinations that have improved performance and lowered costs.
- 2. Primary Operations: For instance could the part start in the cold headers or must it be milled from the bar? Corbin has been highly successful in bringing the advantages of heading to many a "screw machine product" without upsetting cost factors.
- 3. Secondary Operation: You may require such additional refinements as detail finish, plating, special inspection and "kid glove" packing. Corbin can work to precision tolerances in tenths - grind to microinch specifications - and hob, grind or roll threads to Class 4 tolerances.

You may save yourself a lot of time - and money - by working with Corbin from the start.



Facilities are explained in this bulletin — which you will find in Sweet's File 4m10 for Product Designers. If you prefer that we send you a copy, please request it on your

THE CORBIN SCREW CORPORATION

The American Hardware Corporation, Successor



(Continued from page 154)

though a limited supply is now available. The Vitafilm is supplied in film form, in strips slightly less than an inch wide. The fabricators twist and stretch the strips into strong, slender threads.

Then the threads are woven in a variety of colors, patterns and textures on conventional textile mill equipment.

In addition to resisting flame and being easily cleaned, Landefeld said, the Vitafilm fabric resists oil, acids, greases, water, sun-light and fading.

All the usual effects available with other types of fabric, such as braids and brocades, are possible with the Vitafilm

TECHNICOLOR FILM ON ARC WELDING

A new Technicolor sound motion picture titled "Magic Wand of Industry -Arc Welding," just released by the Lin-coln Electric Company, Cleveland, Ohio, portrays the dramatic progress of arc welding from its beginnings to its present vital wartime role. There are also scenes which take the audience into the welding world of tomorrow.



The Technicolor camera crew making close-ups of the arc.

Produced by request of the U.S. Bureau of Mines which is releasing the picture under the title "A Story of Arc Welding", this 25-minute presentation. filmed under the technical direction of Lincoln welding engineers, was staged and photographed in practically every major industry including airplane factories, shipyards, refineries, steel mills and Shasta Dam.

Primarily educational, the film graphically presents the fundamentals of arc welding, the electrical circuit, and the types of welded joints. The true action inside the arc is also revealed for the first time in actual photography and animation, showing the penetrating "are force" which assures high strength and good fusion of all metals. To obtain the photographs of the arc, it was necessary to use a battery of arc lights using power equivalent to 4500 automobile headlights all focused on an area of one square foot

The film is available on 16 mm. and 35 mm. prints to business groups, technical societies, schools and colleges and industrial plants at no charge except transpor-

(Continued on page 160)

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SYLVANIA NEWS

INDUSTRIAL EDITION

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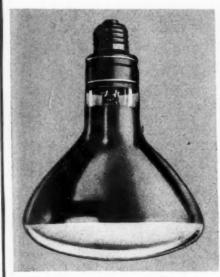
Published in the Interests of Better Sight and Sound

1945

Sylvania Infra-red Lamps Have Wide Industrial Use

Engineered to provide the maximum radiant heat output consistent with long life, Sylvania Electric's Infra-red Lamps offer convenient sources of radiant energy for a diversified list of industrial applications.

Infra-red Lamps have found their most extensive use in the rapid drying of finishes, but they are equally adaptable to a number of other uses, some of which are just beginning to be explored.



The Type R40 Infra-red Lamp—a reflector type lamp—permits economical, flexible application of radiant energy.

For example, infra-red energy appears applicable to many types of dehydration processes; to the drying of sand moulds and baking of cores in foundry practice; and to the preheating of metals or plastics.

Produced in wattage ratings ranging from 125 to 500, Sylvania Infra-red Lamps warrant study in these newer fields of application.

Change in Fluorescent Layout May Pay Dividends in Better Lighting

Before-and-After Contrast in Textile Mill Typifies Improvement Possible



Careful engineering of fluorescent lighting layouts—with due consideration to the specific problems involved—can do much to aid industrial plants in utilizing to the full the inherent advantages of this modern type of illumination. This fact

is clearly brought out by the contrast in the two photographs above, taken in the same manufacturing area of Shannon Hosiery Mills, Incorporated, in Columbus, Ga.

The left-hand photo shows the original fluorescent installation, using six 100-watt fixtures per alley, and providing from 8 to 12 foot-candles—an illumination intensity superior to that found in many industrial plants.

THE NEW SYSTEM

.The right-hand photo shows the new system, planned by Georgia Power Company, and using 24 fixtures per alley, each fixture containing two 40-watt lamps.

This system distributes an average of 70 foot-candles of glareless light; objectionable shadows are avoided; and the work is more clearly visible.

That Sylvania Rough Service Lamps are built to withstand rough handling, jars and bumps—but are not specifically intended to withstand vibration? They can be burned in any position, and are commonly used in extension cords in machine

DID YOU KNOW ...

That Sylvania Vibration Lamps are con-

structed specifically for industrial use

where there is vibration - particularly

from high-speed machinery? They should

not be burned in a horizontal position.

shops, shipyards, derricks, and similar

SYLVANIAFELECTRIC

SYLVANIA ELECTRIC PRODUCTS INC., Salem, Massachusetts

MAKERS OF FLUORESCENT LAMPS, FIXTURES, ACCESSORIES; INCANDESCENT LAMPS; RADIO TUBES; CATHODE RAY TUBES; ELECTRONIC DEVICES

Buy War Bonds and INDUSTRIAL Bonds



BECAUSE every caster in the Bond line is an industrial caster, Bond has no need to offer "compromise" solutions. Bond recommendations are always exactly right for the job—because Bond concentration on industrial casters permits Bond to design, engineer and produce casters to cover the entire range of materials handling requirements.

There's a "volume of experience" in Bond Catalog K-34—because every caster listed in it was engineered by men with practical knowledge of industrial conditions. Write for it today.

Bond 136-A Caster (top). Combines easy swiveling with long service because of special double ball race design and use of durable Bond caster metal.

Bond 140-A Caster (second from top). Sturdy, all steel construction reduces caster breakage. Sizes from 4" to 12", capacities from 450 to 4000 lbs. per caster.

Bond 1640-A-8 Caster (third from top). Equipped with wheel brake. Same construction as 140-A. 8" size only.

Bond 118-A Caster (battom). Triple ball race construction for extra hard service and heavy duty. Cupped raceways assure even wear and long life.

BOND FOUNDRY & MACHINE COMPANY, MANHEIM, PA.



(Continued from page 158)

tation. A short version of "Magic Wand of Industry — Arc Welding" is scheduled for theatrical showings throughout the country.

The Technicolor release may be obtained on request from The Lincoln Electric Company, 12818 Coit Road, Cleveland 1, Ohio, or from the U. S. Bureau of Mines, Experimental station, 4800 Forbes Street, Pittsburgh, Penna.

HIGH PRODUCTION WITH CARBOLOY DIES

Deep drawing dies of cemented carbide are currently giving unexpectedly good results in the production of cases for radio tubes. Here, on an operation where 100,000 pieces per die gives profitable performance, some of the carbide dies have turned out as many as 750,000 pieces —400% more than was calculated before these dies were installed.

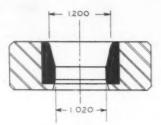
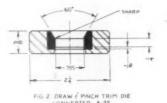


FIG 1 DRAW DIE



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The material being drawn is tin plated sheet steel, .011" to .012" thick. Discs, 2 9/16" in diameter are blanked and cupped in two operations. The first cup is 1 5/32" O.D. and 1½" high. The first draw is in the carbide die illustrated in Figure 1. The cup is then 1.020" O.D. and 1½" high. The second draw is through the die shown in Figure 2. Its diameter is .795" and the draw angle is not blended but is cut 60° included for pinch and trim. The cup is then finish drawn at size .795 by 1 11/16" high and with a .010" wall. The trimmed mouth of the cup is very clean and even. (Note illustration).

Some of the cemented carbide dies of the 1.020" diameter have run as high as 750,000 pieces. One of the .795" diameter dies has, to date, exceeded 100,000 draws and is still turning out excellent grade work. It is also interesting to note that the change over to carbide dies was made within a single week, all machines being equipped in this time by the use of Carboloy stock dies, converted where necessary.

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Stamping this carbine trigger housing from

COLD ROLLED
STRIP

*Saved 720,000 hours machine time

* Saved 635 tons of steel

* Saved \$5,100,000 in cost (on the basis of producing two million pieces)

The conversion of this one part of the U.S. M-1 Cal. 30 Carbine, from a steel forging to copper-brazed strip steel stampings saved more than these substantial amounts of time, materials and money. It also released 97 milling machines, 16 broaching machines and 21 profilers for the production of other badly needed ordnance parts.

The production in strip steel of this trigger housing is typical of the important work of redesign and conversion being done by Ordnance engineers and leaders of the pressed metal industry. Some 800 conversion suggestions like this already put into

actual production have resulted in savings of enormous amounts of critical materials, have released countless numbers of critical machines, have saved millions of man-hours, saved millions of dollars as well.

The ready adaptability of cold rolled strip steel to this far from simple part—in which final tolerances were maintained to within .002" and .005"—and the savings in weight and cost it makes possible are, we believe, significant to every manufacturer who is looking ahead for ways to improve his peacetime product and to reduce its cost.

We have in our files the records of

many such war-time applications of American Quality Cold Rolled Strip that not only indicate the wide field for postwar applications this versatile metal offers but that show, by actual time and cost saved in fabrication, the economic advantages of its use.

Our engineers will gladly discuss this matter in detail with you at your convenience.

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

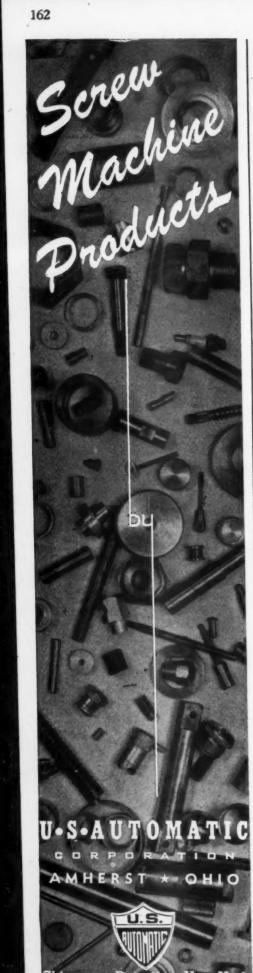
Columbia Steel Company, San Francisco, Pacific Coast Distributors
United States Steel Export Company, New York

UNITED STATES STEEL



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FABRILITE, NEW PLASTIC COATED FABRICS BY DU PONT

Plastics, usually thought of as materials for casting or molding solid objects, have been used to coat and impregnate textiles for special military demands, and the development has now been carried to the point where it is expected to broaden the utility of woven cotton goods, according to an announcement by E. I. du Pont de Nemours & Company, Wilmington, Del.



The coat is of Fabrilite, DuPont Synthetic resin plastic coated fabric.

The materials, called "Fabrilite" plastic-coated fabrics, made with synthetic resin compositions, can be heat-sealed or readily cemented, the company said, and can be given "high" or translucent colors. Designs can be embossed on the surface.

Flexible, light-weight, and unusually tough, the materials are also described as possessing properties which permit ease of cutting and stitching, resistance to perspiration, stains, moths, and food chemicals, resistance also to abrasion, cracking, stretching, or shrinking, but affording high protection against water, cold, wind and dust. They are washable and have good draping properties, the company said.

The range of uses to which plasticcoated fabrics can be put has not been fully explored due to the necessity of concentrating on the military demands, the company said. However, the fabrics are expected to be utilized in protective clothing such as raincoats, shower capes, baby pants, hospital sheefing, shower curtains and other household accessories, from garment bags to bowl covers.

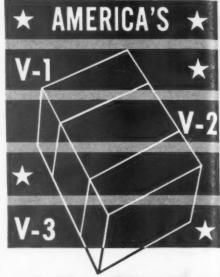
In military uses, the fabrics are now being produced for jungle hammocks, mountain tents, life-raft sails, Army raincoats, and other purposes.

FILMS TEACH SOLDERING AND SHOP SAFETY

New training films of direct interest to the metals industries are announced by The Jam Handy Organization, Detroit, Mich., as follows:

SOLDERING: discussional type slidefilm, comprising a total of 92 teaching pictures-special photographs, drawings and diagrams to help teach modern meth-

(Continued on page 166)



SECRET WEAPONS

Hats off to the Weatherproof Fibre Box Groups for developing the famous V-boxes: V-1, V-2, V-3-overseas shipping containers for vitally needed supplies. We are proud of our part in helping shape the specifications. If you have shipping problems perhaps we can help YOU too. Container Testing Laboratories, Inc., New York, Chicago, San Francisco



Protective Packaging Methods and Materials in universal use today.

Waterproof and corrosion preventive wrapping and caselining papers including crinkled:

> INDUWRAP BROWNSKIN GRIZZLYBEAR RIPPLEKRAFT COILWRAP

> > Ask for Literature and Samples

HUN

FRAMINGHAM, MASSACHUSETTS

How to get UNIFORM Spring Performance



d

STILL AVAILABLE

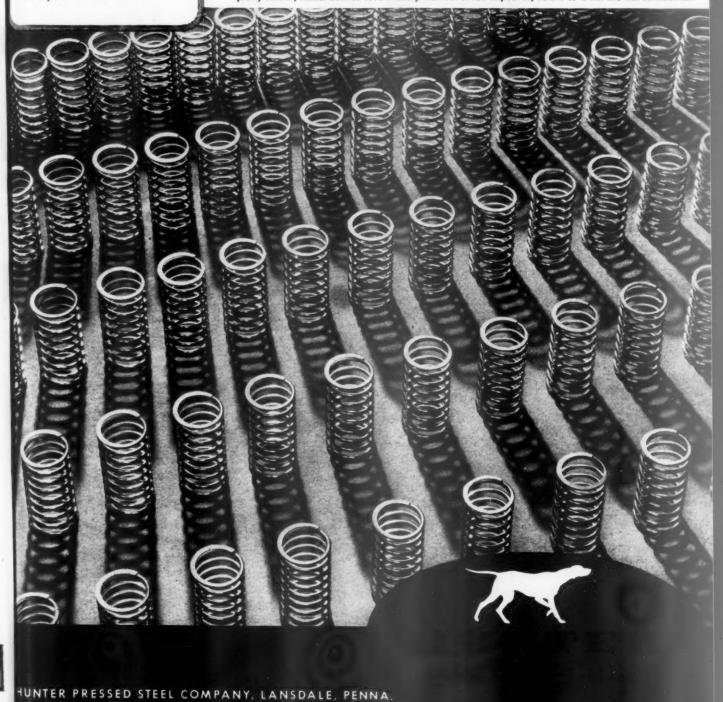
Thousands of copies of the Hunter Data Book, an original work on spring design and specifications, have been requested by product designers and manufacturers. Copies are still available without charge if requested on your letterhead.

IT IS A safe bet that no two things have ever been made which were exactly alike. How then is it possible to obtain from two, two hundred, or two million springs a performance in your product which is uniform? Well, it isn't possible except within certain tolerance limits. The probability of securing uniform performance is, however, mathematically and actually increased by the application of statistical methods in quality control. By an application of such methods, in use for years at the Hunter Pressed Steel Company, it is possible to check and control all of the various factors which may influence the quality character-

istics of the final product, to detect the tendency of a job to run out of control, and to make immediately the adjustments necessary to keep it in control. Statistical control of quality increases the probability of securing a greater number of okay springs in any given quantity and therefore immeasurably increases your certainty of obtaining springs which will perform with a greater degree of uniformity.

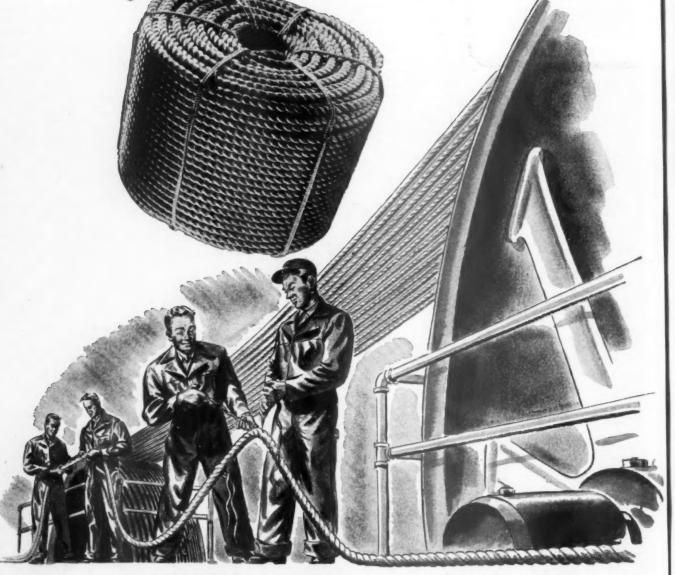
Statistical methods in quality control are, you can be sure, here to stay. Hunter has been a user of the science since 1932 as well as a contributor. Is there any reason any longer to buy guesswork springs?

CONTROLLED SPRINGS—The chances that in any batch of springs (as those below) you will secure the performance you require, are greatly increased by the application of statistical methods in quality control. In order to establish quality control, Hunter devised revolutionary methods of fast inspection, details of which are still confidential.



AP







In steel and textile mills and countless other plants producing war materials, rope drives are used to transmit power. American Manufacturing Company long has specialized in the production of transmission rope. The result of this leadership in manufacture and application engineering has been a widespread and consistent preference for "AMERICAN" Transmission Rope.

Care Saves Rope . . . a Vital War Material

AMERICAN MANUFACTURING COMPANY, BROOKLYN 22, N. Y. . ROPE . TWINE . PACKING . OAKUM

Branch Factory: ST. LOUIS CORDAGE MILLS, ST. LOUIS 4, MO.

Sales Offices: BALTIMORE . BOSTON . CHICAGO . HOUSTON . NEW ORLEANS . PHILADELPHIA



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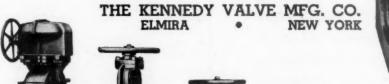


You wouldn't think a DISC HOLDER could have so many ADVANTA

The disc holders in these Kennedy 150 lb. renewable composition disc bronze globe and angle valves are literally crowded with special features and advantages.

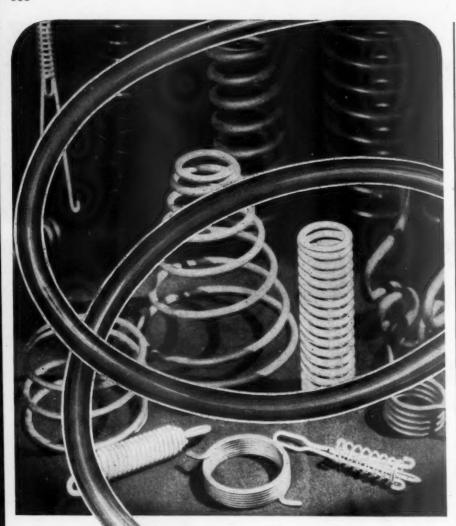
To begin with, four guide prongs are provided to guide the disc holder accurately in the body and prevent tipping or binding. A smooth milled bearing surface in the stem-head recess permits the disc holder to swivel freely on the slightly rounded smooth bottom surface of the stem head so that the disc can accommodate itself to the seat. The outer edge of the holder overhangs the seat so as to permit considerable wear of the disc before renewal becomes necessary.

Then, additional features assist convenience of disc renewal. The holder locks itself positively in place on the stem at a definite position, wide open, so that it cannot fall off when the valve is taken apart. This arrangement protects the disc from damage and prevents the holder from interfering with reassembly of the valve. Once the stem and disc holder assembly is removed from the valve, a mere half-turn of the stem releases the holder and permits it to drop off.





KENNEDY valves...pipe fittings...fire hydrants



SPRINGS! for 1000 Uses

designed by experts to meet individual requirements, and produced in one of the largest and best equipped plants devoted exclusively to the forming, grinding, machining, tempering, heat treating, finishing and testing of all types of springs, wire and flat forms. For a dependable source of supply, through good times or bad, get in touch with "Cleveland." Tell us about your requirements, or let our experts work with your engineers to produce springs for better performance, at lowest possible cost.

Ask for Catalog.

1281 East 38th Street, Cleveland 14, Ohio

(Continued from page 162)

ods and techniques of soldering. film has been widely used in the Aviation field; and is now available to the metal trades generally. Sequences are: uses for soldering, definition, methods and fluxes, types of, applications, heat sources, the bit, steps in soldering, preparing the bit, soldering cables, terminals, taps and splices, soldering sheet metal, and safety precautions.

BASIC SHOP SAFETY: Series of eight discussional type slidefilms suited to any metal working shop or plant-to help promote safety education and to be integrated with any shop safety program which may be in force. Each subject concludes with a series of pointed test and review questions. Subjects are: 1-Play Safe-Work Safely. 2-Maintaining a Safe Shop. 3—Safety Inspection. Training for Emergencies. 5-Treatment for Bleeding, etc. 6—Aid for Injuries. 7—Eye Protection. 8—Power Supply.

32 NEW TRAINING FILMS ANNOUNCED BY U. S. O. E.

The release of 32 new training films, to aid in the training of workers in vocational schools and war industries, was recently announced by the United States Office of Education, Federal Security

The new films, 16-mm. sound motion pictures, cover a variety of subjects such as woodworking, foundry work, aircraft maintenance, and machine shop work. Two are of special importance in rehabilitation work, showing the use of blind workers in industry. Another film, "Care of the Cardiac Patient," is an addition to the U. S. Office of Education Nursing Series. Accompanying each motion picture is a filmstrip, which reviews important points in the film, and an instructor's manual. The new films are planned and supervised by technical experts and visual educators. Subects were chosen for today's training needs and were approved by the War Manpower Commission. Actual production was handled under contract by various producers specializing in this type of film.

U. S. Office of Education visual training aids may be purchased from 250 visual education dealers located throughout the country, or ordered directly from Castle films, 30 Rockefeller Plaza, New York 20, N. Y.

The titles of the new films follow. Prices range from \$17.35 to \$31.29. Prices are for motion pictures. Filmstrips sell for \$1. Instructor's manuals are free.

165. Employing Blind Workers in In-

dustry (No filmstrip)

166. Instructing the Blind Worker on the Job (No filmstrip)

176. The Diode

231. Hobbing a Spur Gear. Part I: Setting Up the Change Gears

232. Hobbing a Spur Gear. Part II: Setting up and Hobbing the Work

233. Hobbing a Square Tooth Spline Shaft

(Continued on page 168)

APRIL

For the biggest nut-turning jobs HERE'S SUPER-POWER... SIFFER SUPER-POWER...

Set big nuts down solidly... with "beef", muscle and powerful leverage! Or break frozen ones loose instantly — there's performance when a Snap-on Heavy Duty Boxocket goes to work!

Performance plus safety! The boxocket opening completely encircles the nut . . . grips it on

all sides . . . it cannot spread, jump or slip. The operator "lays into the job" with complete confidence in his own safety. And the compact offset Boxocket head reaches into cramped quarters inaccessible to other wrenches. The double hexagon broaching gives the advantage of a short turning arc where obstructions restrict free swinging of the wrench handle.

Snap-on Heavy Duty Offset Boxocket wrenches are available in a complete range of sizes from 1\%" to 3\%" opening, with interchangeable handles from 18" to 36" length. Write for 1945 catalog of 3,000 Snap-on hand and power tools for production, assembly and maintenance.

SNAP-ON TOOLS CORPORATION
8048-D 28th AVENUE KENOSHA, WISCONSIN





What it means to you on the FLUORESCENT and INCANDESCENT Lamps you specify or select

The Champion diamond mark signifies that the lamp is made by specialists in the production and service of lamps for industrial use — makers of quality lamps, established 45 years ago and now one of the largest and best equipped organizations in the entire lamp industry.

Lamps back of the Champion diamond mark are backed in turn by trained lighting and lamp experts in the field to give you assurance of the right lamp for the job and prompt assistance on any or all industrial lighting problems.

Lamps bearing the Champion diamond mark are supplied to you through a competent local distributor who is prepared to show you why they give you lowest cost lighting, quality and performance considered.



CHAMPION LAMP WORKS

Lynn, Massachusetts
DIVISIGN OF GONSOLIDATED ELECTRIC LAMP

(Continued from page 166)

- 234. Hobbing a Worm Gear. Infeed Method.
- 259. Installing and Aligning Tail Surfaces
- 260. Adjustments after Check Flight 301. Planing Rough Surfaces to Di-
- mensions
 302. Jointing Edges and End Grain 90
 Degrees to a Face
 303. Beveling, Stop Chamfering and
- 303. Beveling, Stop Chamfering and Tapering Square Stock
- 304. Face Planing Uneven Surfaces 305. Jointing an Edge for Gluing—Installing Knives
- 313. Turning a Cylinder Between Centers
- 314. Turning Taper Work
- 315. Turning Work on a Face Plate
- 316. Turning Work in a Chuck
- 317. Face Turning a Collar
- 348. Tension Testing 367. Flue Gas Analysis
- 419. Care of the Cardiac Patient
- 423. Molding with a Loose Pattern
- 424. Making a Simple Core
- 425. Molding Part Having a Vertical Core
- 426. Molding with a Split Pattern
- 427. Molding with a Gated Pattern
- 479. Hand Soldering.

INSULATING VARNISH SELECTOR AVAILABLE

The job of selecting the correct varmish for treating and insulating coils and windings and for general motor repair can be simplified by using an Insulating Varnish Selector devised by the Resin



and Insulation Materials Division of General Electric Co., Schenectady 5.

The selector, which may be obtained free from any local G-E merchandise distributor, is easy to operate. From a list of varnish applications, the user selects the one for which he wants a varnish. He moves a slide until an arrow points to the chosen application. When this is done, the catalog number of the varnish appears, along with complete data on characteristics, type of base, recommended thinner and baking or airdrying time.

The selector lists seven varnishes, each recommended for a specific application.

SOUND FILM PORTRAYS ABRASIVE CUTTING

"Speed in Cutting" is the title of 16 mm. sound film on abrasive cutting, made available to engineering societies, training schools, educational institutions and manufacturers by A. P. de Sanno & Son, Inc., 106 S. 16th St., Philadelphia, Pa.

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UNITED STATES GAUGE

Manufacturers of Pressure, Temperature, Flow, Electrical and Level Measuring Instruments

Among the ASSOCIATIONS

Oregon Association Given Red Cross Blood Donor Award



Dale Cowen (left) presents Red Cross blood donor award to President Gordon T. Hanson, Purchasing Agents Association of Portland, Ore. Witnessing the presentation are George S. Dury (right), National vice president for District No. 1, and R. P. Stockwell (second from left), chairman of the Oregon group's blood donor committee.

A signal distinction was accorded the Purchasing Agents Association of Oregon, at its Monthly dinner meeting in the Heathman Hotel, Portland, Ore., February 19, when President Gordon T. Hanson, purchasing agent, Stimson Lumber Company, accepted on behalf of the association a Red Cross blood donor award for blood bank contributions by 75 percent of its eligible members. The association is the first in the state of Oregon, other than a business firm, to win such award.

Of 36 members eligible, 28 contributed within two weeks after the start of the project to win the honor award, bringing the association's response to nearly 80 percent. Actually the response was above 90 percent as an additional five members appeared at the blood bank but were declared temporarily ineligible due to recent illnesses or injuries.

R. P. Stockwell, purchasing agent, Gilpin Construction Co., is chairman of the Oregon group's blood donor committee. He is a member of the "Gallon" club, having contributed eight pints of blood.

The association's February 19th meeting was a triple feature meeting. In addition to the Red Cross award presentation, George Drury, vice president for District No. 8 of the National Association, and purchasing agent, Northwest Lead Co., Seattle, Wash., brought

a message from the National; and, H. C. Glaze, wire and cable engineer of the General Electric Co., Spokane, gave a non-technical talk on Copper Wire and Cable

The association's noon luncheon meetings were also featured by interesting programs: Henry Alderman of the Bonneville Administration spoke on "Future of the Columbia River, New Projects and their effect on the development of the Northwest", at the Febroary 9th meeting; a 40-minute film on the manufacture of tires was shown through the courtesy of the U. S. Rubber Co. at the February-23rd meeting; and at the March 2nd meeting Captain S. B. Huntting of the 41st Division Field Artillery Headquarters Communications office, talked on "Experiences and observations in New Guinea."

NATIONAL OFFICERS GUESTS OF CHICAGO ASSOCIATION

President R. C. Swanton and Vice President C. M. Oberling, District No. 3, were guest speakers at the March 13 meeting of the Purchasing Agents Association of Chicago, held in the Hotel Sherman. Mr. Oberling, who is purchasing agent for the National Lock Company, Rockford, Ill., is a former president of the Chicago association. U. S. War Department official film "War Department Report on German Morale" was shown.

ESSAY COMPETITION ON POSTWAR RESPONSIBILITIES SPONSORED BY NATIONAL ASSOCIATION

F. Albert Hayes, Chairman, National Committee on Education, National Association of Purchasing Agents, has announced an essay competition open to members of the National Association on the subject, "The Purchasing Department's Reconversion and Postwar Responsibilities." The purpose of the competition is to develop practical policies and procedures for the guidance of Purchasing Agents in connection with reconversion and postwar activities.

Four awards, each having a face value of \$250 in U. S. War Bonds will be made to authors of manuscripts deemed the most meritorious. Attention is called to the ruling that manuscripts must be placed in the office of the National Association of Purchasing Agents, 11 Park Place, New York, N. Y., either by messenger or by registered first-class mail, not later

than noon on April 16.

Following are the Rules Governing the Competition, issued by Mr. Hayes, which were accompanied with copy of address by Stanley A. Holmes on "How the N. A. P. A. can help in Postwar Problems, or What is planning all about?", as "an excellent springboard for constructive thinking about the competition subject." Mr. Hayes' address is c/o American Hide & Leather Company, Lowell, Mass.

Competition Rules

Subject

1. All manuscripts must deal with the subject: THE PURCHASING DE-PARTMENT'S RECONVERSION AND POSTWAR RESPONSIBILITIES.

Form of Manuscripts

2. Each manuscript must be typed on one side of the sheet, double spaced, on white paper 8½ x 11 inches. Its length shall not exceed 5000 words.

Each competitor must inscribe his manuscript with an assumed name, and in an accompanying plain, sealed envelope, addressed to the Secretary of the National Association of Purchasing Agents, 11 Park Place, New York 7, N. Y., give his real name, the local association to which he belongs, and home address.

The accompanying envelope must also be identified as belonging to the manuscript by the inscription of the assumed name on the outside of the sealed envelope.

velope.

Those Eligible to Compete

3. This competition is open only to members of this Association who are in good standing on April 16, 1945, as shown by the records of the National office.

(Continued on page 174)

PHILCO

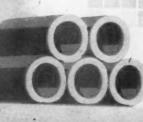
gives you the latest in **Modern Battery** Design!

THOUSANDS of electric industrial trucks are now getting more work done at lower cost because of the advanced research of Philco engineers in developing tougher, more powerful storage batteries. Philco has long led in providing batteries of maximum capacity, with the rugged long-life construction especially engineered for today's heavier work schedules.

Now Philco engineering leadership is demonstrated anew with the storage battery that gives 30% longer life -the great new Philco "Thirty"! For lower cost in handling materials with electric trucks, be sure to include the new Philco "Thirty" in your plans. Now available in preferred types. Complete information gladly sent on request. PHILCO CORPORATION, Storage Battery Division, Trenton 7, New Jersey.

For 50 years a leader in Industrial Storage Battery Development

The new Philco "Thirty" with 30% longer life is identified by







This picture from Leslie's Weekly depicts an 1861 Express van being loaded with war materials. This vehicle was considered a mammoth advance in efficiency.

READY

When The Nation Calls

Throughout American history when a real need arose, a man or an organization has been ready to cope with it. Express shipping is an organized service originated 106 years ago to meet the demands of those times. Since then, through peace and war, Express has promptly adopted every scientific advance so as to be ready for the nation's changing shipping requirements.

Today the major part of the unprecedented volume of Express, both by rail and air, is connected with the war effort. This wartime transportation experience and new handling techniques will aid in the nation's postwar commercial shipping needs.



Present Diplomas to Purchasing Class at Montreal

In conjunction with Annual Ladies Night of the Purchasing Agents Association of Montreal at the Mount Royal Hotel February 22nd diplomas and cash and vice president of the association.

The diplomas were presented to twelve students at the February 22nd meeting, four of whom received cash prizes ranging



Lieut. Resnick receives his diploma and the good wishes of George Deignan, president of the Montreal Association. The studious gentleman next to President Deignan is John Crawford, vice president, and chairman of the educational course.

prizes were presented to students who had successfully completed the course on Purchasing sponsored by the Montreal Association at Sir Georges Williams College. The course is under the able direction of John Crawford. Joseph Clapinson advises that seven previous students are now fully fledged P. A.'s with membership in the Montreal Association. Mr. Crawford is Purchasing Agent for the Sun Life Assurance Company of Canada,

from \$10 to \$25 each. Five of the students are young women, three of whom were among the recipients of the cash prizes.

The accompanying picture shows presentation of certificate to First Lieutenant M. Resnick, who incident to an absence from one of the weekly meetings, offered the unusual excuse that he had been to Brazil delivering a bomber for one of the war theaters.

SALESMAN AS P. A. SEES HIM FORT WAYNE

John Brown, director of purchases, Veeder - Root Corporation, Hartford, Conn., was the principal speaker at the February 19th meeting of the Fort Wayne, Ind. Chapter of Purchasing Agents, at the Fort Wayne Chamber of Commerce, his subject being "The Salesman Today as the Purchasing Agent Meets Him." The meeting which was attended by numerous salesmanagers and

salesmen as guests of the association, was in charge of Harold Berry. Mr. Brown was introduced by Herb. Buehler, district vice president.

C. F. McLeish, chairman of the program committee, states that Mr. Brown gave a very interesting talk on his experiences in purchasing in the past 20 years, telling about the various types of salesmen he has met. After Mr. Brown's talk, the meeting was thrown open to a general question and answers discussion,

(Continued on page 174)



Purchasing Agents, Sales Managers and Salesmen enjoy John Brown's reminiscences of salesmen he has met, at recent meeting of Fort Wayne Purchasing Agents
Association.

PENN SALT

Special tank cars for liquid (50% and 72-73% solution). Solid in 700 lb. drums ... flake in 125 and 400 lb. drums.

Some of the Products Manufactured by Penn Salt:

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ACIDS, Sulphuric, Muriatic, Hydrofluoric,
Hydrofluodilicic, Nitric • AMMONIA • ALUM,
Hydrofluodilicic, Nitric • AMMONIA • ALUM,
Sulfate of Alumina • HYDRATE OF ALUMINA,
Sulfate of Alumina • HYDRATE OF ALUMINA,
BIEACHING POWDER • AMMONIA,
BIEACHING POWDER • CARBON BISUIFHIDE
Anhydrous and Aqua • CARBON BISUIFHIDE
• CARBON TETRACHICORIDE • CAUSTIC

**CARBON TETRACHICORIDE • CAUSTIC
SODA • CORROSION-RESISTING CEMENTS
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Opacifier • *KRYOCIDE Insecticide • *ORTHOSIL AND *PENNSALT METAL CLEANERS
THOSIL AND *PENNSALT METAL CLEANERS

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NEW YORK + CHICAGO + ST. LOUIS - PITTSBURGH + CINCINNATI + MINNEAPOLIS + WYANDOTTE + TACOMA

APRI



Delta-Milwaukee Machine Tools

Delta provides a new approach to tooling proven sound by war production - without the delay and heavy capital risk involved in buying costly, cumbersome, inflexible, special machines.

Using low-cost, stock-model Delta components, you can modernize machines in your plant that are rapidly approaching obsolescence, salvaging parts still in good condition.

You can devise high-production, special-purpose machines that can be quickly converted to other uses when conditions change.

And, because of the portability and compactness of Delta-Milwaukee Machine Tools, you can revise production line layouts, to get the best sequence of operations for increased output per man-hour, with minimum change-over time.

You cut down your fixed investment in machine tools . . . retain more liquid working capital for other post-war needs. Delta's savings in cost and in weight and space - are not obtained at the expense of quality. They result from advanced design and from quantity production of standard models.

For a flexible, safe, satisfactory solution to the uncertain production problems that lie ahead-and for results that are creditable to all concerned - tool up with low-cost Delta-Milwaukee Machine Tools.

Tear out coupon and mail today!

Delta's 76-page Blue Book

provides 140 case histories of valuable war production experience that may suggest similar money-saving peacetime applications in your plant. Also available is a catalog of low-cost Delta-Milwaukee Machine Tools. Request both, using coupon at right.



THE	DELTA	MANUF	ACTURIN	ig co.	
					Wisconsin
	Please . Blue Bo	send my ok and c	free co	opies of	Delta's 76-page ost machine tools
Nan	ne				

Position Company... Address.

N. A. P. A. Essay Competition

(Continued from page 170)

Ownership of Manuscripts

4. All manuscripts submitted in this competition shall become the property of the National Association of Purchasing Agents for such use as the Association may decide to make without compensation to the author.

Time of Competition

5. Manuscripts must be placed in the office of the National Association of Purchasing Agents, either by messenger or by registered first-class mail, not later than noon on April 16, 1945.

Awards and Prizes

6. The president of the National Association of Purchasing Agents will appoint three final judges, at least two of whom shall not be members of the Association of Purchasing National Agents. Preliminary judges, to eliminate all but approximately 12 manuscripts which in the opinion of these judges have merit, and are most qualified for further consideration, shall be appointed from the membership of National Association of Purchasing Agents. It is the intent that awards be made only for manuscripts of merit. Four awards, each of face value of \$250 in U. S. War Bonds, are available and will be given to the authors of manuscripts deemed most meritorious among those which have qualified for consideration by the final judges. The decision of the judges shall be final.

The award shall be made at the May, 1945, convention of National Association of Purchasing Agents, if held; otherwise by announcement through the

Disqualification of Manuscripts

7. Manuscripts will be excluded:

(a) if the author's true name is revealed in any way prior to decision by the final judges;

if the manuscript exceeds 5000 words or is not submitted in the form prescribed;

(c) if it is mailed or delivered after April 16, 1945;

(d) if it does not adhere to the prescribed subject.

John Brown at Fort Wayne

(Continued from page 172)

the answers all pointing in one direction, that being the improved relationship that now prevails between the purchasing agent and the salesman.

Mr. Brown was accompanied to Fort Wayne by L. Spaunburg, vice president of the Veeder-Root Corporation.

POSTWAR PLANNING DISCUSSED AT ROCKFORD MEETING

Whipple Jacobs, president of the Belden Manufacturing Company, was the principal speaker at the February 13 meeting of the Purchasing Agents Association of the Rock River Valley, held in the Faust Hotel, Rockford, Ill. His subject was "The Business Man Looks Ahead."

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den ncig of the. aust 16,000,000 G-E ballasts have been installed since 1938 ... 99.5 per cent are still going strong



G-E ballasts are a powerful sales feature to add to your product.

FLUORESCENT-FIXTURE BUYERS:

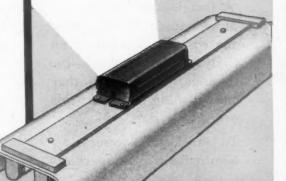
Ballasts are an important component. Specify G-E -to help assure good performance, negligible maintenance, and long life of your fluorescent installations.

HERE'S a recent report from a Midwestern bomber plant: "The 12,000 G-E ballasts we installed in 1942 have been operating round-the-clock ever since. To date there have been only six electrical failures." A performance record 99.99 per cent perfect!

This experience is not unique. Even the over-all operating record of G-E ballasts—which are now powering more than a billion watts of fluorescent lighting in America's war plants—is better than 99.5 per cent per-

Other outstanding features of G-E ballasts are: quiet operation assured by an unusually close fit between core and coils and a rigid clamping structure; cool operation - assured by use of low-loss materials, and a special insulating compound that rapidly dissipates heat; matched characteristics—matched with the lamps they are to operate to assure rated lamp life and rated light output; adaptability - convenient dimensions that permit a standard-width wiring channel for practically all fixtures, thus helping fixture manufacturers reduce cost and simplify their parts inventory.

For information on our complete line, ask for our newly revised catalog (No. GEA-3293F). General Electric Co., Schenectady 5, New York.



GENERAL % ELECTRIC



Buy all the BONDS you can and keep all you buy

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SOFT LANDINGS!

- MR. BREN GUN CARRIER

★ Imagine the shock these Muehlhausen Springs must absorb when this Bren Gun Carrier hits the ground—the thousands of pounds they must cushion to protect this overgrown jeep.

To meet such operating requirements, the specifica-

tions for these springs are exacting; to meet the demands of the war program, the quantities are huge. These two objectives would be difficult to achieve, were it not for Muehlhausen's

craftsmanship and manufacturing facilities.

At Muehlhausen, one

MUEHLHAUSEN SPRING CORPORATION

Division of Standard Steel Spring Company

675 Michigan Ave., Logansport, Indiana

complete plant is devoted to hot-coiled springs. Here the most modern and highly specialized heat treating and forming equipment assure quantity production.

MUEHLHAUSEN

SPRINGS

EVERY TYPE AND SIZE



Couplings for fuel oil and gasoline hoses must absorb a lot of wrench abuse. So Scovill forges them of brass to give them the kind of toughness only forging provides. And by ingeniously forging them without webs on the inside, Scovill saves weight on the couplings and reduces scrap.

Tiny levers for an aircraft application must be dense and uniform so that the ten thousandth piece will be as safe and dependable as the first. So Scovill forges them of aluminum...two levers in the same die...and saws the forging in half for more economical production.

When Scovill's ingenious designing, expert die-making, knowledge of metal behavior, diversity of metal-working facilities and years of experience are focused on a problem in metal parts, they invariably arrive at the *one* best answer. That's why records of Scovill production for more than 3000 firms show that Scovill usually produces metal parts better at the same price or equally good at lower cost.

Remember—Scovill works in all metals with such processes as forging, drawing, stamping, casting, pressing and finishing ... and therefore can honestly recommend

the one best process for solving your problems in metal parts production. For proof of Scovill's ability, fill in the coupon below and get the free booklet "Masters of Metal".



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inders, Welding and Blow Torches, etc. Household Appli-
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Company	*********
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CHARLES C. HARVEY HEADS CALIFORNIA GOVERNMENTAL PURCHASING GROUP

Charles C. Harvey, Purchasing Agent, City of Pasadena, Calif., was elected president of the California State, County and Municipal Purchasing Agents Association, at the annual conference of that body held at the Senator Hotel, Sacramento, February 15, 16 and 17. Verne O. Gehringer, Purchasing Agent for San Diego County, San Diego, Calif., was re-elected secretary-treasurer. Speakers on the program were as follows:

A. Earl Washburn, Deputy Director, Reconstruction and Reemployment Commission, State of California, subject, "California, War and Postwar."

Richard Carpenter, Legal Counsel, League of California Cities, subject, "Proposed Legislation of Interest to Public Buvers."

DeWitt Krueger, Chief, Division of Research and Statistics, Board of Equalization, State of California, subject, "State and Local Revenues."

Lieut. Commander J. M. McCool, U. S. N. R., subject, "History and Operation of Naval Supply Depot at Oakland."

Al. J. Holm, president, National Institute of Governmental Purchasing, Inc., Purchasing Agent, City of Los Angeles, subject "Aims and Objectives of the National Institute of Governmental Purchasing."

Herbert A. Olson, Western Regional Manager, Public Administration Service, subject, "Importance of Centralized Purchasing to State and Local Government."

H. Leland Weber, past president, Purchasing Agents' Association of Northern California, Purchasing Agent, Fibre-board Products, Inc., subject, "Yes, We Have Priorities."

George H. Moore, State Printer, State of California, subject, "Activities of the State Printing Department."

Col. John F. Hough, Regional Director, Office of Surplus Property, Procurement Division, U. S. Treasury Department, San Francisco, led a discussion of the program established by the new Federal Surplus Property Board.

A. S. Dudley, secretary-manager, Sacramento Chamber of Commerce, address at annual dinner, at which Governor Earl Warren was guest of honor, on "Postwar Program for California's Capital City."

A. R. Lama, president, Purchasing Agents Association of Los Angeles, Inc., "Public Relations in Purchasing."

Through the courtesy of Admiral Arthur H. Mayo, delegates were accorded the privilege of visiting the Oakland Naval Supply Depot. Arrangements for this visitation were made by Lieutenant Commander J. M. McCool.

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7 7 7 ROCHESTER INDUSTRIAL BUYERS DISCUSS PLASTICS

Plastics proved an interesting subject at the February meeting of the Rochester Association of Industrial Buyers held at the Hayward Hotel February 21st. The speaker for the evening was Malcolm M.

(Continued on page 182)



APRI

Finding better ways"...

A 56 YEAR HABII at Peninsular

DAY AFTER DAY for more than 56 years, Peninsular engineers have carried on their search for new materials—new methods—better ways to manufacture grinding wheels and apply them to the problems of production in industry.

How well they have succeeded is reflected in the excellent reputation which Peninsular enjoys throughout heavy industry and wherever grinding wheels are used.

It can also be measured by the fact that many of the basic advancements in the fabrication of grinding wheels—in the machinery for their manufacture—and in their application to modern industrial problems have come from Peninsular.

Yes, finding "better ways" is definitely a habit with Peninsular—a habit you can count on in the future as industry turns to peacetime production.

A STANDING INVITATION

Our expert staff of factory and field engineers are ready today to help in your preparation for regular production—with an engineering and cost analysis service beyond any offered up to now in industry.

The Peninsular Grinding Wheel Company, 729 Meldrum Ave., Detroit 7, Mich. *Branches:* Chicago, Cleveland, Newark, Philadelphia, Pittsburgh.

CORPUALISTS IN RESINCID RONDED WHEELS

PENINSULARG

Types of Wheels for Rough Grinding



RINDING WHEELS



APRIL



Uniformity of prescribed physical and metallurgical properties, within exacting limits. Laboratory controlled. Standard and special grades. Custom-made for particular jobs.

JOHNSON STEEL & WIRE CO., INC. WORCESTER I, MASSACHUSETTS.

CONTROLS FOR WORLD MARKETS

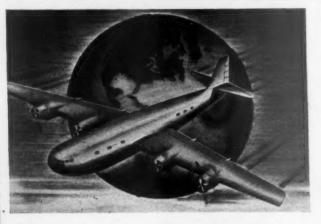




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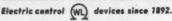


Ward Leonard Controls have an enviable record of performance in war equipment. On the sea, under the sea, on the ground, and in the air-subjected to widely varying climatic conditions in all parts of the world!

Obviously manufacturers who are planning world-wide post-war markets can be certain that the Ward Leonard controls incorporate in their products will give continuous trouble-free service.

Write for our catalogs describing the types of controls you need.

RD LEONARD



WARD LEONARD ELECTRIC COMPANY 50 SOUTH ST., MOUNT VERNON, N. Y.

(Continued from page 178)

Taylor of the E. I. du Pont de Nemours Company, who spoke on "Plastics."

Mr. Taylor traced the beginning of plastics from their inception to the present, reviewing current developments and He emphasized the importance of making plastics selection based on the enduse of a proposed product, stating that there are many kinds of plastics, each of which has special characteristics and use values. He expressed the opinion that the future will bring greatly expanded uses of plastics, and warned that use of plastics in products for which they are not suited would do more harm than good.

NEW ORLEANS AWARDED HONORS IN "QUIZ OF TWO CITIES"

Contestants representing the Purchasing Agents Association of New Orleans won top honors by a margin of ten points in a recent "Quiz of Two Cities" radio program, in competition with a team representing the Purchasing Agents Association of Houston, Texas. The names of the contestants on the New Orleans winning team, are as follows:

Emil L. Morvant, Treasurer and Purchasing Agent, Realty Operators, Inc.,

New Orleans;

Fred E. Lind, President, New Orleans Association, and Secretary-treasurer and Purchasing Agent, The Louisiana Coca-Cola Bottling Co., Ltd.;

Stanley Mayo, Purchasing Agent, Freeport Sulphur Co., New Orleans;

Patrick H. Dillon, Director of Pur-chases, Patrick H. Dillon, Inc., New Orleans.

Mr. Lind states that though the program which is sponsored by a national advertiser, has been on the air for some time, this is the first time that the purchasing agents' associations took part. It is broadcast in that section each week by Station WWL in New Orleans and Station KTRH in Houston, and lasts about 30 minutes, starting at 6:30 PM.

The radio stations endeavor to get only outstanding organizations to participate in the program. An effort is made to enlist similar organizations in each city. Mr. Lind feels that the broadcast constituted excellent publicity for the good of the profession of purchasing. In explanation of the routine followed he says:

"The contestants are each asked a series of three questions, ten points being awarded for each of the correct answers to the first two questions, and twenty points for the third. For example, if New Orleans is called upon to open the contest, the first contestant from that city would be called upon to answer a series of three questions. Then the program is switched to the competing station and its first contestant is called upon to answer a series of three questions, and thus the program runs back and forth until all four contestants have participated. Following the regular series of questions there is a jackpot question for which fifty points are awarded for answering the question within the 20 seconds

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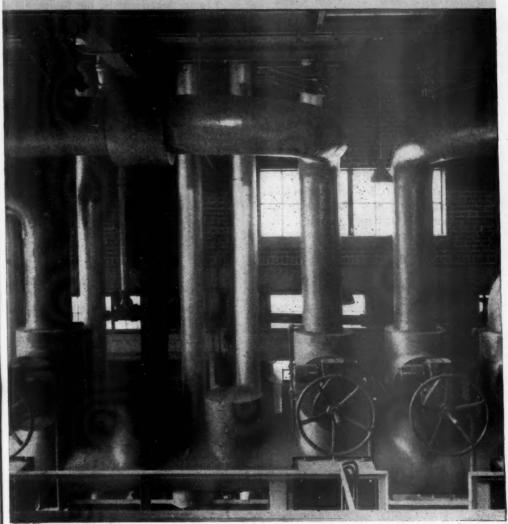
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INTERPRETIVE Enqueering EXPERT Prefabrication ENGINEERED Suspension



O USERS of power or process piping GRINELL service is complete. Included are expert interpretation of piping layouts, modern pipe fabricating equipment and hangers engineered for each specific requirement. You will find it good business to consult Grinnell engineers for assistance on any piping installation.

GRINNELL COMPANY, INC. Executive Offices, Providence 1, R. I.

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GRINNELL PREFABRICATION

Facilities include every type of modern equipment for the efficient fabrication of piping. Scientific inspection of welds by means of the latest X-Ray and Gamma Ray equipment plus thorough pretesting of the finished pieces assure delivery of Underwriters' Approved sub-assemblies.



GRINNELL CONSTANT-SUPPORT HANGERS

For constant support of piping in all "hot" and "cold" positions . . . full safety factor of the supported system always maintained . . . individually calibrated . . . minimum headroom required.



GRINNELL ENGINEERED SPRING HANGERS

Save engineering time . . . stock hangers for loads ranging from 84 lbs. to 4700 lbs. Change in supporting force of hanger held below 12½% in ½" vertical travel of piping.

APRIL



Lighting engineers, maintenance men and workers are enjoying more efficient fluorescent lighting by using G-E Watch Dog Starters. These manual reset starters have provided the utmost in all-around fluorescent lighting service in war factories all over the nation.

Why these three prefer G-E





LIGHTING ENGINEERS—specify G-E Watch Dog Starters because of their unusually long life. The Watch Dog outlasts five ordinary starters. This is equivalent to approximately three years of lighting service.





MAINTENANCE MEN—like G-E Watch Dog Starters because they reduce fluorescent lighting maintenance to the simple job of pressing a red button before relamping. Reset it...forget it.





WORKERS—are more satisfied with lighting fixtures equipped with G-E Watch Dog Starters because they banish annoying blink and flicker of dying lamps. Blinking cannot possibly recur once the Watch Dog Fluorescent Starters lock out.

Would you like to know more about G-E Watch Dog Starters? Write for our bulletin "How to Use Fluorescent Accessories for Best Lighting Results." Send your request to Section G452-77, Appliance and Merchandise Dept., General Electric Company, Bridgeport, Connecticut.

BUY WAR BONDS AND KEEP THEM



(Continued from page 182)

allotted. Contestants are first asked their name and business connection, and one or two questions about their business. "The contest between Houston and ourselves was nip-and-tuck all the way," writes Mr. Lind, "and we were fortunate in finally winning by ten points."

INAUGURATE PURCHASING PROB-LEMS, DISCUSSIONS — VANCOUVER

Departing from the normal type of program held formerly, the February 13th meeting of the Purchasing Agents Association of British Columbia, Vancouver, B. C., at the Vancouver Hotel, inaugurated what may well prove to be a regular part of future meeting activities, according to J. B. Watson.

It was decided by the executive committee that more emphasis should be placed on mutual discussions of subjects, problems and procedures pertinent to the purchasing profession, that would be of educational benefit to the membership. Accordingly, Program Committee Chairman Cliff Kirby, arranged for the following program:

The subject for discussion was "Indents for Materials." This was discussed by a panel of six members, as follows: Andy Urquhart, Vancouver General Hospital; Bill Pettigrew, Marshall Wells, B. C. Ltd.; Duncan Capstick, Imperial Oil Ltd.; Bill Green, General Construction Co.; Borden Smith, Canadian Fishing Co., and Jack Reid, B. C. Sugar Refinery Ltd.; and Cliff Kirby, Vancouver General Hospital, chairman.

A prearranged set of eight questions dealing with the subject under review has been prepared, and each panel member was given one question on which he was permitted to talk three minutes. The panel members had previously been notified of the question allotted to them, and thus had ample time to prepare a suitable answer thereto.

The questions were handled alternately, first by the panel, and then in general meeting. Mr. Watson said that the program lasted for about an hour and a half during which much useful information was elicited. There is little doubt, he states, that meetings of this type will prove popular, for they are of educational value. Each member of the association will be asked to serve on a panel.

H. L. Taylor, Canadian National Railways, who had tendered his resignation was voted an honorary life membership in the association, in recognition of his many years of untiring effort in association activities, which date back to when he was elected as the first president of the association.

President Archie Scott announced that the Annual Tri-State Conference, Washington, Oregon and British Columbia, originally planned to be held in Washington this spring would in all probability be cancelled due to transportation and other wartime restrictions in the United States.

President Scott was invited by the Van-(Continued on page 186) SING

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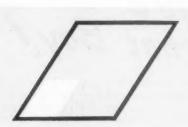
Here's How HIGH-SOLIDS Lacquers Cut Finishing Costs

It's not the cost per gallon that determines finishing costs—more important to consider is the finishing cost per unit!

High-solids lacquers mean thicker, fewer coats and many other savings that cut production costs drastically. Here's how:



High-solids nitrocellulose lacquers deposit thicker films at spraying viscosity, giving you the same finish with fewer coats.



You save valuable floor space with high-solids lacquers. The fewer number of coats, the smaller the area needed for finishing and work in process.



It's easy to apply high-solids lacquers by any of the usual commercial methods . . . spraying, flow-coating, tumbling, dipping, or roller-coating.



Nitrocellulose lacquers are still the fastest-drying finish . . . in minutes at room temperature. No expensive baking equipment is needed.



One of lacquers' biggest advantages is the ease with which any scratches or imperfections in the finish can be retouched or repaired. Ask your supplier for complete details. Hercules makes no lacquers . . . concentrates on production of highest-quality nitrocellulose.

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GENERAL'S

"Part of the Product"
Plan

GENERAL Engineered Shipping Containers are designed to the product. Frequently the product and the container come off the production line together—as a unit.

Result: You save space, materials, man-hours and packing costs. Just a pesky bull pup and his tough old man... and how proud he is of junior. You, too, are proud of your product. Proud of the constant improvement in workmanship, materials and design. So don't just put it in a box... put it in a GENERAL Engineered Shipping. Container. There are many good reasons:

GENERAL boxes are planned specifically to the product, for the product. They're designed to provide positive protection, with minimum weight. They're compact, extra strong and shipworthy. They're actually a "Part of the Product."

Our engineers will be glad to help you with your postwar packing problems. Write today for complete information on our free Engineering Service. Let us show you how GENERAL boxes cut costs, conserve materials, save man-hours, and speed production. Remember, if the product deserves your name . . . it also deserves a GENERAL Engineered Shipping Container!





General All-Bound Box

Send for "The General Box" — this booklet illustrates General Box Company's "Part of the Product" Plan.

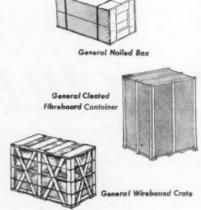


ENGINEERED SHIPPING CONTAINERS

General BOX COMPANY

GENERAL OFFICES: 4B W. Illinois St., Chicage, Ill. DISTRICT OFFICES AND PLANTS: Broeklyn, Cincinnati, Decroit, East St. Louis, Kansas City, Louisville, Milwaukee, New Orleans, Sheboygan, Winchendon.

Continental Box Company, Inc.: Houston, Dallas.



(Continued from page 184) couver Junior Board of Trade to address a gathering of its members at a sales training course sponsored by the Board. He spoke on the general theme of cooperation between buyer and seller.

UTAH ASSOCIATION TOLD ABOUT RF MIRACLES

An eye opening discussion of the post war radio and television world was conducted by Alvin G. Pack, program director for radio station KDYL, Salt Lake City, Utah, at the February meeting of the Purchasing Agents Association of Utah.

He gave a graphic description of how radio frequencies will be responsible for tremendous time savings incident to the utilization of electronic heating in the preparation and cooking of foodstuffs. He also stated that in the comparatively near future television would be broadcast in Salt Lake City to be shortly followed by television in color. Mr. Pack gave a preview of the limitless possibilities for conveying information, advertising merchandise, and public education by means of television broadcasting. His description of miniature personal sets for television reception that will be carried about by individuals, is described as being very intriguing, by John E. Carr, who states that Mr. Pack's discussion emphasized the responsibility that Purchasing Agents have of keeping abreast of developments and knowing where their application may best be made.

Mr. Carr states that the Utah Association's annual Ladies Night was a real treat, and the program was particularly enjoyable since it was the first time that the group and their wives had been together since last summer. An excellent dinner was featured by one-inch steaks.

George S. Drury, national vice president, District No. 1, was guest speaker at the March meeting of the association.

DISPOSAL OF GOVERNED-OWNED SURPLUS, NEW YORK

Joseph P. Woodlock, Assistant Director of Surplus Property, Reconstruction Finance Corporation, Washington, D. C., talked on "Disposal of Governed-Owned Surplus" at the Forum meeting of the Purchasing Agents Association of New York, at Builders Exchange Club, February 20th.

Mr. Woodlock explained that in all cases, articles which are bought will measure up to specifications which have been given prospective buyers. The change in policy, he said, has been made possible by the use of better inspection of materials declared as surplus by the armed

services.

"In the maelstrom of war where plants are frequently cleared out with the utmost speed to convert them to other types of production, the workers sometimes fail to label material properly," he said. "We took all the material turned over to us as surplus according to the description fur-

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Bunting, largest producer of Cast Bronze Bearings for Aircraft Engines, has the skill, experience and equipment to make equally fine Cast Bronze Bearings for many other applications. These bearings excell in precision, fine finish and uniform physical and metallurgical qualities. The Bunting Brass & Bronze Company, Toledo 9, Ohio. Warehouses in principal cities.

Bunting

BRONZE BEARINGS & BUSHINGS & PRECISION BRONZE BARS

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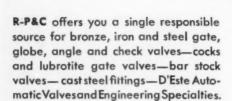


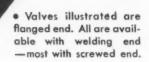
... in the low pressure range where high temperature, corrosive liquids, fire hazards or need for unusual precaution against leakage or line strains make iron valves impractical—that's where R-Pac 150 lb. steel valves and fittings serve best.

READING-PRATT & CADY is especially well-equipped to make these valves, having long specialized on pressure castings of electric furnace steel. Beyond that, R-P&C rigid control—from drawing board to final test—assures you of maximum service from every READING-PRATT & CADY valve.

The line is extensive, including globes, angles, gates and checks in all the standard pressure classes from 150 lbs. to 1500 lbs.

We suggest that you get a recommendation from R-P&C the next time you need valves.







READING-PRATT& CADY



READING CAST STEEL VALVES AND FITTINGS . PRATT & CADY BRASS AND IRON VALVES
D'ESTE VALVE AND ENGINEERING SPECIALTIES

Reading, Pa. • Atlanta • Boston • Chicago • Denver • Houston • Los Angeles • New York • Philadelphia • Pittsburgh • San Francisco • Bridgeport, Conn.

READING-PRATT & CADY DIVISION AMERICAN CHAIN & CABLE

In Business for Your Safety



ACCO



Wood truss bridge, preframed and pressure-creosoted by Koppers.

What is Koppers?

this ... and more!

What is Koppers? Koppers is really a "network" of industrial companies. This Koppers "network" touches a cross-section of industrial America. Consider the lumber business, for example.

Lumber offers a great many inherent advantages as a structural material.

But wood has three enemies; They are: first, decay, second, insects (like termites) and, third, marine borers, (along the oceans).

People used to think that decay was the result of "old age" in wood. It isn't. It is caused by low forms of plant life called "fungi." The remedy is simple. Pressure-treat the wood and you kill the fungi or prevent it from getting a foothold. The wood then retains its strength indefinitely.

The same process also protects wood from termites and marine borers... and it led to the development of methods of making wood fire-resistant.

The process of protecting wood is called pressure-treating. Chemicals are forced into the fibers of the wood under great pressure. Koppers operates 21 plants for pressure-treating.

The principal material used in pressure-treating is creosote. Great quantities of creosote are produced by Koppers.

The principal source of creosote is the modern coke oven. Koppers builds the bulk of the coke ovens.

Thus, Koppers is helping to open vast new fields for lumber by making its product more permanent. Koppers Company, Inc., Pittsburgh 19, Pa.

APR

WIDE, COORDINATED RANGE of stock units . . . from "TT" manual starters for small motors to complete multi-motor CONTROL CENTERS.

TRUMBULL . PIONEERED VERTICAL CONTACT design prevents dust and carbon

WIRING, INSPECTION, RE-MOVAL and REPLACEMENT of parts FROM THE FRONT —saves installation and maintenance time.

COMPACT, SPACE-SAVING COMBINATIONS include starter and disconnect switch or circuit breaker in same box.



Trumbull MOTOR CONTROL EQUIPMENT TYPE "CM" MAGNETIC STARTERS

CALL YOUR TRUMBULL Electrical Wholesaler REFER TO YOUR TRUMBULLIST

THE TRUMBULL ELECTRIC MFG. CO., PLAINVILLE, CONN. A GENERAL ELECTRIC TO ORGANIZATION

OTHER FACTORIES AT NORWOOD (CINN.) O .- SEATTLE-SAN FRANCISCO-LOS ANGELES



(Continued from page 186)

nished. However, we have learned that we could not safely do so.

"Under the old policy of 'as is, where is', it was not possible to make changes. Now we are discarding the negative sales of approach of 'as is, where is', and stating that the article measures up to specifications we give."

Mr. Woodlock declared that the agency has now linked its 23 main and assisting sales agencies in a teletype system to speed trancontinental transactions, and in addition, an inventory control system is being developed.

At the dinner meeting which followed, President Millard W. Merrill announced that the membership roster was now well past the 600 mark, with a total of 608. The speaker at the dinner meeting was Ray Josephs, South American correspondent, whose subject was "Argentina, The Post War Powder Keg."

FORUM ON MATERIALS AT NEW ORLEANS

The regular monthly meeting of the Purchasing Agents Association of New Orleans held at the Jung Hotel on March 12, was devoted to a forum on materials that are still on the critical list, presented by members of the association, each of whom was given three to five minutes to discuss his subject from the standpoint of market conditions, price structure, inventories, postwar prospects, etc. After their presentation, the meeting was given over to general discussion of the subjects. the speakers forming a board of experts which answered oral and written ques-

The speakers and their subjects were as follows:

Steel, A. G. Assenheimer, Jones & Laughlin Steel Corp., and M. F. Hilbert, Woodward-Wright & Co., Ltd.

Plumbing and Mill Supplies, Edw. H. Loubat, American Heating and Plumbing Co., and J. A. McMurray, Crane Co.

Fuel—Coal, Leslie J. Marks, DeBar-deleben Coal Corporation; Fuel Oil, A. G. Clark, McWilliams Dredging Co.

Machine Tools and Machinery, Edgar Haas, Stauss & Haas, Inc., and Patrick H. Dillon, Inc.

Airplane Industry Problems, Roy L. Baker, Consolidated Vultee Aircraft Corp. Shipbuilding Industry Problems, G. W. Bofinger, Delta Shipbuilding Co., Inc.

On Wednesday, February 21st, members of the association were guests of the Flintkote Company where they witnessed the production of asphalt roofing, and enjoyed a buffet supper.

"WHAT'S NEW IN PURCHASING" WILMINGTON, DEL.

1 1 1

Stuart F. Heinritz, Editor of Purchas-ING, addressed a luncheon meeting of the Industrial Purchasing Agents Group of Wilmington, Delaware, at the Dupont Hotel, February 26th. His topic was "What's New in Purchasing". L. J. Fin-

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Another New NORTON GRINDER_

It's the Norton 4" Type C-a grinder that gives extreme accuracy, high production and convenience of setup and operation on a wide variety of small revolving parts used in instruments and mechanisms of modern high speed machinery and appliances. Electronic control of headstock permits speeds from 100 to 1000 r.p.m. This fast, accurate, convenient Norton Grinder is engineered to meet the production requirements of many cylindrical grinding jobs on small work.

NORTON COMPANY, Worcester 6, Mass.

Behr-Manning, Troy, N. Y., is a Norton Division

Particularly suited to grind—

GUN PARTS

AIRPLANE PARTS

AIR CONDITIONING PARTS

HEATING EQUIPMENT PARTS

GAGES

INSTRUMENT PARTS

REFRIGERATION PARTS

AUTOMOBILE PARTS

PUMP PARTS

SMALL MOTOR SHAFTS



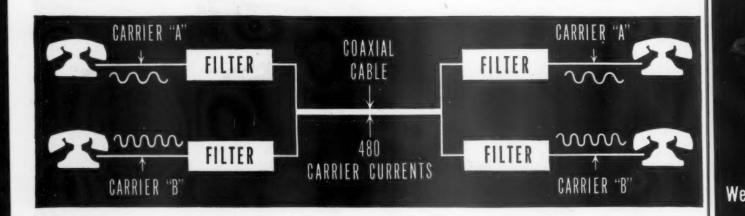
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APRIL,



Crystal gateways for your voice





Four hundred and eighty telephone conversations over a coaxial cable was one of the last peacetime achievements of communication research in Bell Telephone Laboratories. In this multi-channel telephone system, each conversation is transported by its own highfrequency carrier current. At each

end of the line are crystal gateways; each opens in response to its own particular "carrier" with the message it transports. In telephone terminology, these gateways are filters.

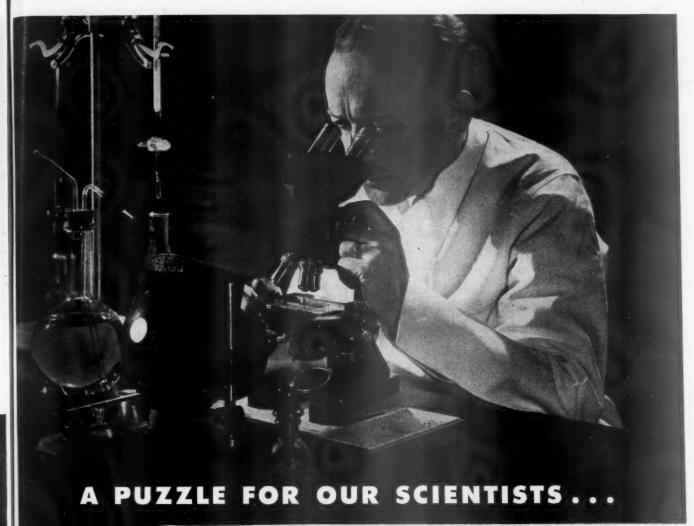
The ultra-selective characteristic of these filters is made possible by piezo-electric quartz plates, cut in a special manner from the mother crystal, and mounted in vacuum. Each set of plates is precisely adjusted so that the filter responds only to the frequency of its assigned channel, rejecting all others. In the coaxial terminal equipment, such crystal gates sort out messages for delivery to their four hundred and eighty individual destinations.

In recent years, Bell Telephone Laboratories research has provided the Armed Forces with many types of electrical equipment in which frequency is controlled by quartz crystals. Notable is the tank radio set which enables a tank crew to communicate over any one of 80 different transmission frequency channels by simply plugging in the appropriate crystal. The future holds rich possibilities for the use of quartz crystals in Bell System telephone service.

BELL TELEPHONE LABORATORIES



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HOW TO SAVE YOU A PENNY

Weatherhead Firsts

Solving Problems for Industry

ERMETO FITTINGS

Q-A HOSE END FITTINGS

BRAZED STEEL FITTINGS

HYDRAULIC BRAKE LINES AND BRAKE FITTINGS

FIRE-RESISTANT HOSE ASSEMBLIES

THE WEATHERHEAD T-RING PACKING

HAVE you thought much about performance of small parts in new peacetime products-and how much these parts cost?

Countless times since 1919 Weatherhead has been assigned the job of saving "a penny a part" for a manufacturer-and has solved the puzzle and delivered a finer part in the bargain. At Weatherhead this kind of thinking begins at the beginning-in the laboratory-where a steadily growing staff is trained to consider engineering, production

and marketing factors all as interlocking parts of each job at hand.

One of many examples:-When hydraulic brakes were adopted for the automobile, Weatherhead developed a hydraulic brake line only one-half the size of those previously used, and produced it for less cost to the automotive industry.

That's why we can say, "Look ahead with Weatherhead." We invite you to write our Sales Engineering Department for assistance in solving your postwar parts problems now.

Look Ahead with



company letter-head for "Seeds Of Industry" — 24-page illustrated story of Weatherhead facilities and products ready to serve you.

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THE WEATHERHEAD COMPANY, CLEVELAND & OHIO Plants: Cleveland, Columbia City, Ind., Los Augeles Canada - St. Thomas, Ontario

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CM Bulletin 142 illustrates and describes every operating feature that makes the CM Meteor Heavy Duty Electric Hoist an outstanding production time-saver...cutting deep into materials handling costs. Helical gears, aeroplane cooling, low headroom, safety limit brake, simplified maintenance...these and other advantages are explained in terms of operating efficiency and service life. Various types trolleys and accessory equipment, lift and speed tables, dimensions, etc., are included.

We invite you to write today.

Just ask for Bulletin 142.

Capacities from ½ ton and up.
Lifting speeds from 18 to 60
feet per minute...Low headroom. Hook suspension, plain,
geared or motor driven trolley.

CHISHOLM = MOORE

(Affiliated with Columbus-McKinnon Chain Corporation)

GENERAL OFFICES AND FACTORIES: 136 Fremont Ave., TONAWANDA, N. Y. SALES OFFICES: New York, Chicago and Cleveland

(Continued from page 190)

nan, Jr., of Hercules Powder Company presided at the meeting, and J. W. Johnston of Atlas Powder Company served as chairman of the day. The meeting marked the completion of two years of association activity, during which time the group has held monthly luncheon meetings the year round and has grown from a nucleus of fifteen to a healthy membership of seventy-eight buying officers representing forty-five companies. The Advisory Board for 1945-1946 has been elected as follows: J. K. Conant, D. G. Stewart, A. N. Kalmbacher, L. J. Finnan, Jr., and H. B. Van Dyke.

NOMINATING COMMITTEE APPOINTED AT CLEVELAND

President R. E. Gray of the Purchasing Agents Association of Cleveland, announces the appointment of the following Nominating Committee to draw up a slate of candidates for office in the association for the year beginning with the annual meeting in April:

Chairman, Harry B. Markle, Harris-

Seybold-Potter Co.

W. E. Bletch, The Universal Valve & Pittings Co.
B. E. Bergquist, General Electric Co.,

Lamp Department.
T. D. Hudson, American Steel & Wire

Company. L. C. Mayer, United Screw & Bolt

Company.

At the association's Annual Executive meeting held in February at the Hotel Cleveland, Ralph W. Carney, Sales Manager of the Coleman Lamp & Stove Co., Wichita, Kans., spoke on the subject, "A Business Man Speaks Up." before an audience of 275 members and guests.

MEMPHIS ASSOCIATION NOW HAS 51 MEMBERS

President W. E. Rier of the Purchasing Agents Association of Memphis, announced two new members at the February dinner meeting of the association held at the Gayoso Hotel, making a total of 51. The new members are T. Cordell Linder, Conley Frog & Switch Co., and Wm. R. Crockett, F. & S. Electric Co.

The meeting was highlighted by a round table discussion, in the course of which each member gave a brief review of the nature of the business of the company he is associated with, making comments on his special duties as Purchasing Agent. The purpose was to help the members become better acquainted with each other.

Guest speaker at the February dinner meeting of the Women's Purchasing Agents Association, was Lieut. Col. Victor Haas, Sr. Surgeon, U. S. Public Health Service, in charge of malaria investigation, who at present is stationed in Memphis.

Introduced by President Mary Speltz, Col. Haas told of his experineces in Burma, China and India. Describing the Burma road from Mumming to Lashio, a

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BUMPS

A new Bassick caster for trailers extra-sturdy where it takes abuse

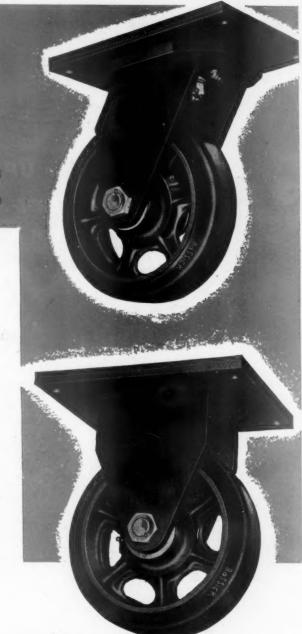
This is a caster especially designed for the abuse of powerpulled trailer truck service. At every vital point, there is extra strength, to give longer, trouble-free life.

Note these strong points. 5/8" diam. balls rolling in machined raceways, on a 6½" diam. ball race, with Timken roller thrust bearing. Heavy gauge steel plate in frame and top plate. Heavy-duty semi-steel or iron core rubber-tread roller-bearing wheels. Alemite pressure lubrication. 3" swivel offset.

These Bassick Trailer Casters are offered in 8", 10" and 12" sizes, with either standard or "Floating-Hub" (shockabsorbing sprung wheel) construction. Swivel or rigid type.

And for any caster requirement—small or large—look to Bassick for: 1, The exact type and size to fit your requirements, for Bassick makes the world's most complete line. 2, Special Bassick features that improve handling, reduce maintenance, lengthen life of casters, portable equipment and floors.

For our bulletins on any caster type, write now to THE BASSICK COMPANY, Bridgeport 2, Connecticut. Division of Stewart-Warner Corporation. Canadian Division: Stewart-Warner-Alemite Corporation, Ltd., Belleville, Ontario.



You save a lot of labor And speed production faster When anything you want to move Is on a Bassick Caster.



Making more kinds of Casters... Making Casters do more

Bassick

APRIL



METAL SPOKE WHEELS . GEARS AND FORGINGS . RAILWAY TRUCKS

(Continued from page 194)
1000 mile stretch which took five years to build, he said that the workers on the Burma road work died by the thousands from malaria. He was the first person to drive a jeep down the Burma road. He also discussed the people of Burma and their customs, reciting some of his personal experiences with them.

EXECUTIVE NIGHT MEETING WASHINGTON, D. C.

At the February dinner meeting of the Purchasing Agents Association of Washington, D. C., held at the Mayflower Hotel the evening of the 13th, George Renard, secretary-treasurer of the National Association of Purchasing Agents gave another of his interesting talks "From one P. A. to Another", in which he stressed the importance of a realistic approach to postwar planning in terms of three, six and nine months, rather than any general planning for an indefinite future. Mr. Renard visualized an industrialized world with increased responsibilities for Purchasing Agents.

C. Warner McVicar has been appointed secretary-treasurer of the Washington association, replacing Curran Ridout who has resigned his position with the Procurement Division to accept the post of Assistant Purchasing Agent of the Review and Herald Restaurant, was duly approved.

proved.

Lt. Comdr. Charles Harding, Bureau of Supplies and Accounts, U. S. Navy Department, entertained the group with selections on the piano.

VISIT PUBLISHING HOUSE ALSO HOLD SALESMEN'S NIGHT

B. F. Downey reports that Dr. R. E. Tulloss, president of Wittenberg College, gave a very interesting review of A. W. Zelomek's new book "Now Comes Tomorrow," his review and personal observations being followed by a forum discussion that was educational and thought provoking, at the February 28th meeting of the Springfield (Ohio) Purchasing Agents meeting at the Shawnee Hotel, with President Don Applegate presiding.

On March 14th the members had the pleasure of visiting the Crowell-Collier Publishing Company, and on March 28th joined with salesmen in a Salesmen's

Night meeting.

TALK ON FILES LEHIGH VALLEY

Walter R. Buerckel, factory representative of the Nicholson File Co., spoke on "Files, Their History, Manufacture and Applications," at the February 26th meeting of the Lehigh Valley Purchasing Agents Association, at Hotel Easton, Easton, Pa.

Mr. Buerckel supplemented his talk with photographic slides and motion pictures. He said that there is much misunderstanding as to file terminology, and also the uses of files, with the result that

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WALWORTH

Pipe Fittings

A complete line of standardized types in

STEEL

in series 150 to 1500



Cast Steel Fittings



Steel Welding Fittings



Forged Steel Flanges

BRONZE



125 Lb and 250 Lb, Screwed ends



150 Lb and 300 Lb Walseal ends



3,000 Lb O.W.G., Walseal ends

IRON



125 Lb and 250 Lb Cast Iron



150 Lb Malleable Iron



300 Lb Malleable Iron

Walworth's comprehensive line of pipe fittings is made in a wide range of types and sizes to meet every piping requirement. A few of the many regular Walworth fittings are illustrated above. All Walworth fittings are made to the highest standards of quality, both as to dimensional accuracy and metallurgical properties. In design, construction, and performance, they reflect Walworth's 103 years' experience in the manufacture of quality valves and fittings.

For detailed information on Walworth's complete line of valves, fittings, and pipe wrenches, see your local Walworth distributor or write for a free copy of Catalog 42.



TO 4 PLANTS

WALWORTH
valves AND fittings
60 EAST 42nd ST., NEW YORK 17, N.Y.

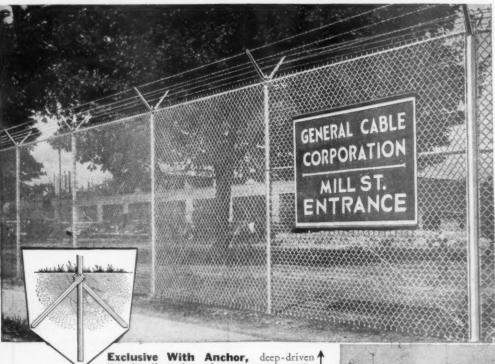
LABORATORY CONTROL



To assure strict adherence to specifications, sample test bars of the metals from which Walworth Pipe Fittings are made are subjected to regular testing in Walworth laboratories. These and other regular controls and inspections assure the high quality of all Walworth Pipe Fittings. The illustration shows a test on a cast iron transverse bar.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

APR



Anchor Square Frame Gates, built of 2" square steel tubing and inseparably butt-welded at all corners, provide amazing rigidity, with freedom from sagging and warping. Anchor "Clamp-On" Hinges permit 180° swing of gate.

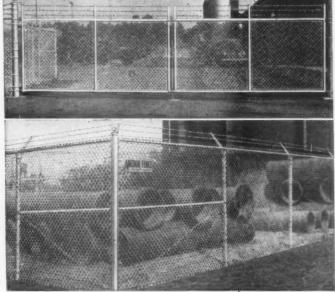
Exclusive With Anchor, deep-driven "Anchors" are clamped to the posts at right angles to the fence line—forming a three-point "tree-root" anchorage deep in the sub-soil which holds the posts permanently erect.

ORDER YOUR ANCHOR FENCE NOW at Pre-war Prices

ORDER Anchor Fence now and get the benefit of pre-war prices . . . plus Anchor service in expediting erection . . . plus exclusive Anchor features which you will find in no other chain link fence. For example, deep driven Anchors hold Anchor Fence permanently erect and in line in any soil . . . permit erection in any climate or weather . . . yet make it easy to take up and relocate Anchor Fence without loss if your plant area changes.

Need A Fence Repaired, Realigned Relocated, Painted?

Through its branches in all major cities, Anchor's nation-wide erecting and maintenance service is ready to give you quick action. Look in your phone book . . . call a trained Anchor Fence engineer . . . and let Anchor's 53 years of industrial fence experience help you.



Protecting Outdoor Storage of materials and supplies
... controlling employee and other traffic in and out of the
plant ... shutting out trespassers, snoopers and troublemakers ... are all in the days work for Anchor Fence.

Send Today for Illustrated Catalog

Our big Industrial Fence Catalog is packed with information, illustrations, diagrams and ideas—and it's yours for the asking. Just write to any of our three factories: Anchor Post Fence Co., 6615 Eastern Ave., Baltimore 24, Md.; 1505 Gentry St., Houston, Tex.; 616 Anderson St., Los Angeles, Cal.



-ON ANY FENCE PROBLEM CALL ANCHOR

OKONITE "FIRSTS" FOR THE NAVY

• First to offer a corrosion-resistant lead alloy coating for

• First to develop a method of assembling conductors to increase resistance against twisting ("Unilay") • First to supply conductors insulated with a non-flammable

• First to protect conductors with flame-resistant glass fiber

• First to manufacture the synthetic impervious sheath for

protecting cables ("Okoseal")

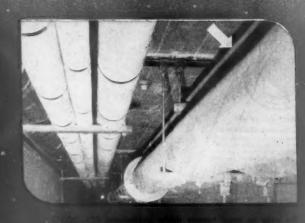
they

ALL benefit **ALL** industry

Meeting Navy demands has been more than a challenging experience to Okonite chemists and research engineers. It has helped to introduce better products of greater value to all industry. Among Okonite's pre-war developments in electric cable and insulated wire are many which have been improved and which have found their greatest usefulness in wartime. Some of them whose service advantages have commercial applications are listed and illustrated. Write for further information on any or all of them or for assistance on any specific problem involving the transmission or distribution of electrical power through insulated wires and cables. The Okonite Company, Passaic, New Jersey.



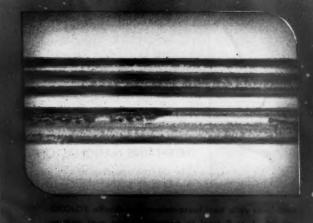
OKONITE insulated wires and cables







OSEAL as a flexible shooth, in addition to the above lyantages, is light in weight and mechanically strong



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faces and recesses are reached by the cleaner. The work is moved up and down in the solution many times a minute, imparting a vigorous swishing contact of the cleaner on dirt deposits which greatly speeds the cleaning

Used with the Magnus Cleaner designed for the kind of dirt involved, the finishing operation required and the metal to be cleaned, this machine will cut cleaning costs and give vastly improved cleaning results.

Write For Complete Data

Ask us to send you com-plete data on the type and size of machine and recom-mended Magnus Cleaner to solve your particular clean-ing problem.

MAGNUS CHEMICAL CO. 93 SOUTH AVENUE, GARWOOD, N. J.



(Continued from page 196)

files generally speaking are very much abused and misused tools. He explained the construction and uses of various Nicholson files, exhibiting hand files, rotary files, milled-tooth files, and the Nicholson Company's newest development, the supershear file. The super-shear file has the tooth construction milled off-center with cross serrations to keep the file clean when used even on the softest materials.

Approximately 25 shop superintendents and foremen from various industries joined with the P.A.'s in this dinner-talk on files. W. G. Blum was chairman of

the meeting.

PURPOSES OF OPA TOPIC AT TULSA MEETING

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Ben O. Kirkpatrick, district director of the Office of Price Administration, Tulsa, Okla., and William C. Hemphill, price attorney for the district, talked on "Purposes and Functions of OPA" at the February 13 meeting of the Purchasing Agents Association of Tulsa, their talks being followed by a question and answers period. The priorities committee of the association, headed by C. F. Hamm, Evalyn Maurer and W. G. Curtis, lead a discussion on priorities at a forum preceding the dinner meeting.

M. S. Johnson, manager of the St. Louis branch of the Solvay Sales Corporation, was the principal speaker at the association's February 27th meeting, his subject being "The Alkali Industry." March 13th, following a short business meeting, the members visited the plant of

the Hanlon-Waters Company.

INTERNATIONAL FINANCE AND AIRCRAFT - SEATTLE

Featured on the March 8th program of the monthly dinner meeting of the Purchaing Agents Association of Washington, Seattle, Wash., were discussions on international finance, and the aircraft industry. Dr. Howard H. Preston, Dean, College of Economic and Business, University of Washington spoke on the former, his subject being "An International Financial Program." Hugh D. McGuiness, City Purchasing Agent, Boeing Aircraft Co., gave an interesting talk on "The Aircraft Industry." dinner meeting was preceded by a "Priorities Up To Date" forum session. with Carl C. Nissler, Regional Priorities Manager of the WPB as counselor, and W. D. Anderson, chairman of the Association's Educational Committee, presid-

1 1 1 LOUISVILLE ASSOCIATION ENTERTAINS NATIONAL OFFICERS

The March meeting of the Purchasing Agents Association of Louisville, Ky., was switched from March 20 to March 23 to accommodate the schedule of National President R. C. Swanton and Vice President George H. Cole, Seventh District.

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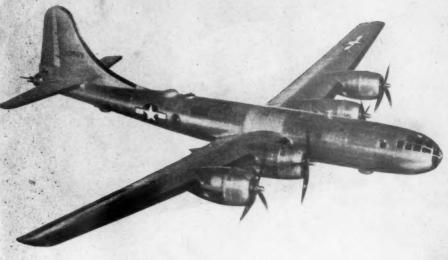
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onal resirict. SPEED NUTS OVER TOKYO



Boeing uses thousands of SPEED NUTS on every B-29 Superfortress to make them lighter, faster and deadlier.



Photos courtesy of Booing Aircraft Company







SPEED NUTS HELP THESE BOEING WORKERS BOOST B-29 PRODUCTION

TINNERMAN PRODUCTS, INC.

2050 Fulton Road, Cleveland 13, Ohio

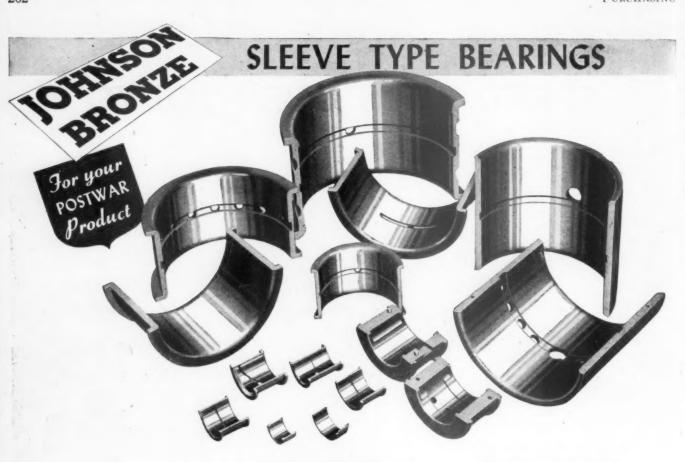
In Canada: Wallace Barnes Co., Ltd., Hamilton, Ontario

In England: Simmonds Aerocessories, Ltd., London



PASTEST THING IN FASTENINGS

APR



Babbitt Lined BEARINGS

SLEEVE TYPE BEARINGS

Cast Bronze Bearings
Cast Bronze Graphited
Sheet Bronze Graphited
Sheet Bronze Graphited
Bronze and Babbitt Bearings
Steel and Babbitt Bearings
Steel and Bronze Bearings
Ledaloy!
Self-Lubricating Bearings
Electric Motor Bearings
Automotive Bearings
Bronze Bors
Bronze Costings

Any Type
Any Size
Any Quantity

Designers of the postwar automobile may worry about the lines of their new car . . . or synthetic rubber versus natural . . . or the thousand and one new developments that have come as a result of the present conflict. There is, however, one worry that they can forget . . . and that's the type of bearings to use in the engine. Years of research and practical tests have definitely proven that babbitt lined bearings deliver the best all around performance for internal combustion engines.

The dual construction of this type of SLEEVE BEARING provides conformability to the shaft . . . resistance to pounding . . . smooth, quiet performance at high speed . . . exceptionally long bearing life, and excellent running-in properties.

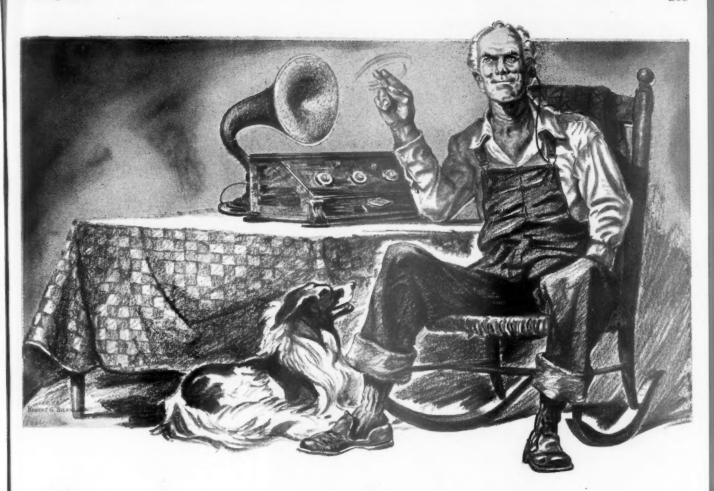
Babbitt Lined Bearings are ideal for a wide variety of applications. They are "tailor made" in the sense that you have a wide range of alloys to select from in the babbitt, and a choice of backing material—either bronze in any of the various alloys, or steel. Why not permit a Johnson Engineer to study your bearing problems? He can easily advise you on the correct type of bearing for each application. There is one located in the cities listed below—ready to serve you.

DISTRICT SALES OFFICES: Atlanta · Boston · Buffalo · Chicago · Cincinnati · Cleveland · Dallas Detroit · Kansas City · Los Angeles · Minneapolis · New Castle · New York · Newark · Philadelphia Pittsburgh · St. Louis · San Francisco · Seattle

JOHNSON SLEEVE BEARING 450 S. MILL STREET



BRONZE HEADQUARTERS NEW CASTLE, PA.

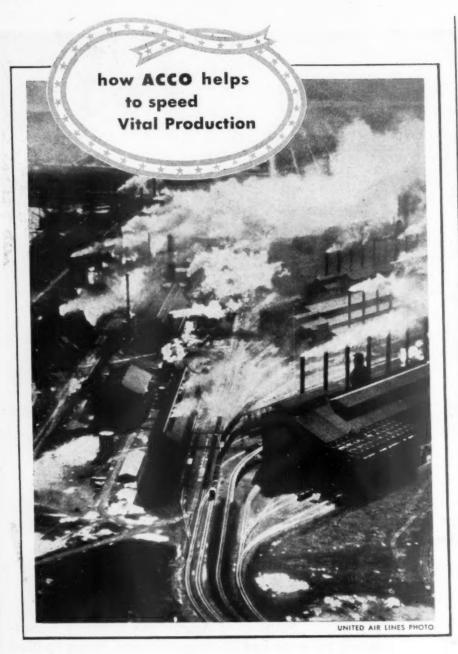


NOW UNCLE ZEKE IS "HEP" TO HEARING!



Millions of Americans formerly handicapped by impaired hearing now are being thrilled by sounds they thought were fading from their lives. Today, inconspicuous yet scientifically-perfected devices are performing miracles by restoring to the afflicted, their priceless auditory sense. Many manufacturers of efficient hearing aids rely on rugged, light-weight Mason Mailmasters to safeguard their delicate instruments from plant to purchaser. If you manufacture small products or parts, investigate the advantages of the Mason Mailmaster—the ideal container for domestic or overseas shipment.

MASON BOX COMPANY



Some products of American Chain & Cable become parts of other manufactured products, others serve as factory or transportation equipment. For example, brake controls for passenger cars made by Automotive and Aircraft Division, American welded and weldless chain, Maryland bolts and nuts, American Cable wire rope, Wright hoists and cranes, Campbell abrasive cutting machines, "Rockwell" hardness testers, Reading steel castings, Page wire and welding electrodes, Reading-Pratt & Cady valves.

Each of the 15 divisions of Acco helps to speed production with many primary products-vital in war-essential in peace.

ACCO

BUY MORE WAR BONDS

ALLED AMERICAN CHAIN & CABLE - BRIDGEPORT
CONNECTICUT

(Continued from page 200)

The two officers were guests of the officers of the local association at a luncheon at the Pendennis Club, at which local, district, and national matters were discussed.

At the dinner meeting held at the Kentucky Hotel, President Swanton discussed "Free Enterprise in Business". He prefaced his talk with the comment that he had lived in Louisville 50 years ago, and that this was his first visit to the city since that time. Mr. Cole gave a brief account of conditions in the Seventh District.

Arrangements for the visit of the national officers were in charge of a special committee headed by L. G. O'Connor, National Director. The attendance was larger than that of any meeting held in the past year.

DISCUSS CONTAINER SITUATION AT N. W. PENNA. MEETING

The regular monthly meeting of the Purchasing Agents Association of Northwestern Pennsylvania was held at the Hotel Carver, Warren, Pa., Thursday Feburary 1st, with 30 members and guests in attendance. President E. F. McCollough presided. An interesting commodity discussion on paper and paper vontainers was presented by H. L. Kaness of the Knox Glass Associates, Inc., and a commodity discussion on steel was continued from the past meeting under the leadership of G. A. Carlson of the Pennsylvania Furnace & Iron Co., Warren, Pa., with special comment on the possibility of additional price increases that may be expected.

These discussions were followed by the showing of a film, 'Bridging San Francisco Bay", which was presented through the courtesy of the Carnegie- Illinois Steel Corporation, represented by development engineer C. H. Fitzwilson, and sales representative Harry Taylor.

USE OF GRAPHITE EXPLAINED AT SAGINAW

Harold Mitchell, chief engineer, and Albert J. Lent, superintendent of the U. S. Graphite Co., Saginaw, Mich., were guest speakers at the February 13th meeting of the Saginaw Valley Purchasing Agents Association at the Bancroft House in Saginaw.

At the association's March 13 meeting, Secretary of State Herman H. Dignan and representatives of the state purchasing agent's office spoke on state purchasing practices.

POSTWAR BROADCASTING TWIN CITY MEETING

S. W. Pozgay, transmitter engineer. General Electric Co., Chicago, Ill., discussed "Broadcasting Postwar" at the February 14 meeting of the Twin City Association of Purchasing Agents at the Minneapolis Athletic Club. Mr. Pozgay

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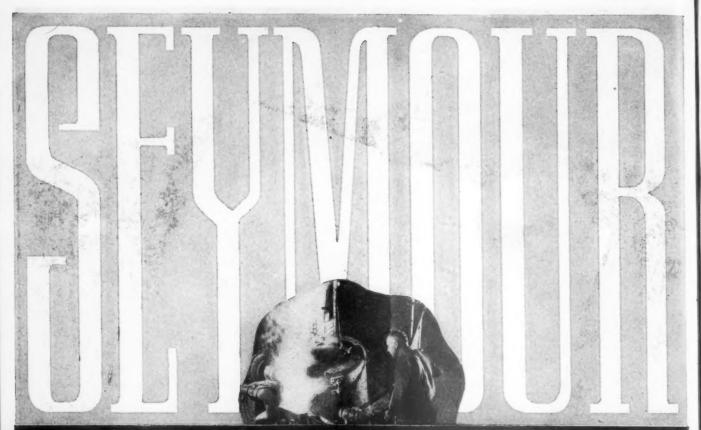
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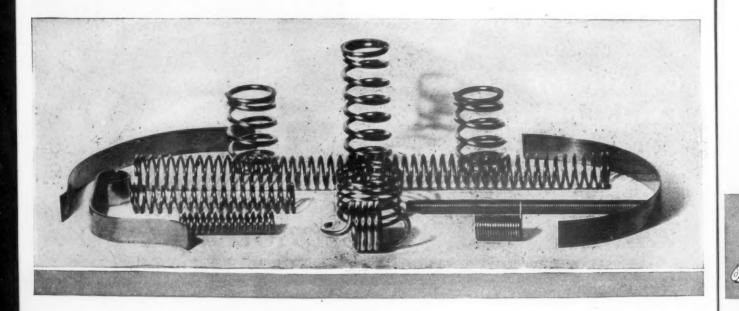
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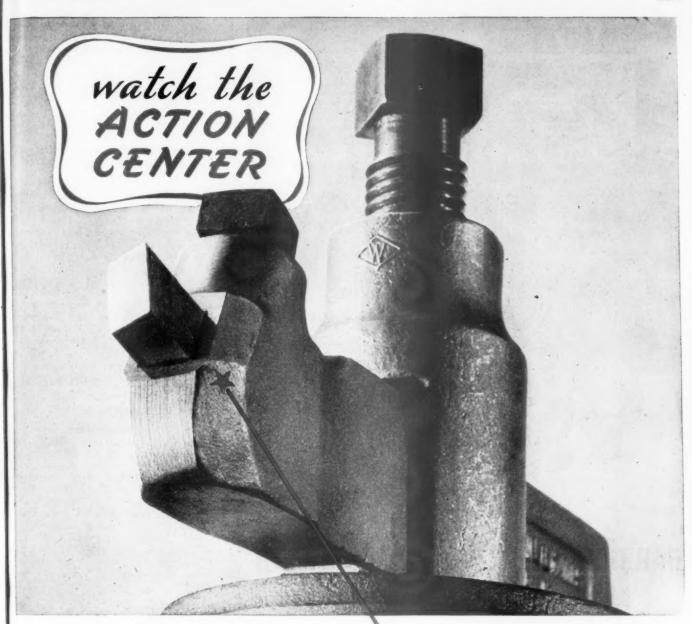


PHOSPHOR BRONZE

Just a fraction of a percent of phosphorus converts a copper-tin mixture into "phosphor bronze"—an alloy unlike either of its constituents. Toughness, lasting resilience and high corrosion resistance immediately become its major characteristics. These qualities make it an excellent material for springs in electric snap switches, meters, measuring instruments and innumerable other devices that must function on their own, and often under extremely corroding conditions.

THE SEYMOUR MANUFACTURING CO., SEYMOUR, CONN.





ACTION CENTER of any lathe is the cutting tool. Here all the power, speed and precision built into the machine focuses its productive performance. Here Williams Tool Holders will insure clean, chatter-proof cutting and uniformly high production. Williams Holders are available in a wide size range of standard patterns for every regular operation of lathe, planer and shaper .. both High Speed Steel and Carbide Cutter types. All are drop-forged, precision-machined and specially hardened. Their sturdy construction assures a long, accurate cutter seat. Sold by Industrial Distributors everywhere.

J. H. WILLIAMS & CO., Buffalo 7, New York.





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HARRISBURG STEEL CORPORATION

Manufacturers of

Alloy and Carbon Steel

Seamless Steel Cylinders, Liquefiers, Pipe Couplings and Slush Pump Liners

Drop Forgings and Drop-Forged Steel Pipe Flanges

Coils and Bends

Harrisburg, PENNSYLVANIA

(Continued from page 204)

complemented his talk with a picture explaining frequency modulation, radio and television, and demonstrated the latest type of recording device known as the wire recorder. He was assisted by Paul Reed, engineer for the General Electric Company in Minneapolis.

LEONARD T. BROWN HEADS SALESMEN-PURCHASING AGENTS ASSOCIATION

Leonard T. Brown, salesman for the Lott Merlin Co., Bridgeport, Conn., was elected president of the Salesmen and Purchasing Agents of America, Inc., at the annual meeting of the organization at Bridgeport, Conn., in February. Horace V. Lips of the General Electric Supply Company, was named first vice president; Fred Brink of the Brink & Cotton Company, second vice president; George Raiselis of the Bassick Company, treasurer, and Forrest C. Benson, district manager of Dictaphone Co., secretary.

PURCHASING AGENT IN CONTROLLED ECONOMY — BIRMINGHAM

Alton P. Barr, vice president, Security Savings Bank, Birmingham, Ala., was guest speaker at the March 1st luncheon meeting of the Purchasing Agents Association of Alabama, Birmingham, Ala., at the Redmont Hotel, Birmingham. Mr. Barr, who was formerly connected with the Reconstruction Finance Corporation, spoke on "The Purchasing Agent in a Controlled Economy." Two new members were introduced, namely, G. B. Gordon, Ingalls Shipbuilding Corp., and Henry P. Davis, Continental Gin Company.

EXECUTIVES NIGHT AT FORT WORTH

The February meeting of the Purchasing Agents Association of Fort Worth, Tex., held at the Worth Hotel, Fort Worth, on the 20th, was dedicated as Executives Night, the business program being rationed as follows: Basil S. Roper, Texas Motors, "Gazes into Ford Crystal Ball," 10 minutes; J. H. Brillhart, Ft. Worth Structural Steel Co., "Steel, Alminium and Magnesium, Their Place in the Post War World," 10 minutes; Buyrl Wilson, Double Seal Ring Co., "My Business," 10 minutes; and Fred Cunningham, Axtell Co., National Releases, 10 minutes.

EDUCATIONAL BUYERS DISCUSS DEPARTMENTAL COSTS

The Metropolitan Section of the Educational Buyers Association met at the Commodore Hotel, New York City, on January 23rd. E. G. Bullwinkle of the City College of New York was in charge of arrangements, and W. B. Foulk of Prince-

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SATISFYING THE WORLD'S TOUGHEST CUSTOMER

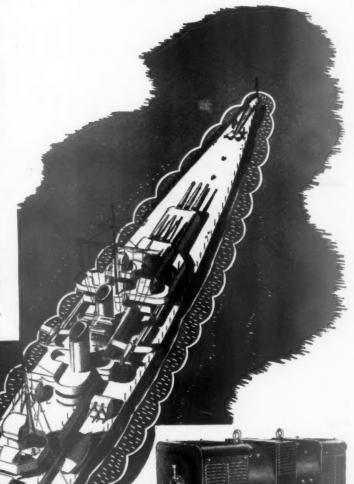
INVISIBLE ARMOR

id every American vessel in dangerous waters roday is a broad band of "invisible armor" – the electrical field of a DeGaussing belt – protecting it against magnetic mines.

These mines took a terrific toll of shipping early in the war. Buried deep in the sea they were difficult to detect and remove. Any ship passing within the magnetic field of a mine detonated it; force of the explosion was sufficient to crumple steel hulls many feet away.

Prompt installation of DeGaussing equipment was the answer to this enemy weapon. Star was called upon to help. Here again the U. S. Navy was a "tough customer" to satisfy – the Bureau of Ships demanded motorgenerator sets that established new standards for compactness and ability to resist shocks and strains; called for quick delivery.

While the Navy does not endorse any product, the fact that Star was able to design and build the special equipment for DeGaussing installations, and maintain unfailing delivery schedules, is ample evidence of the high engineering skill of this organization. That engineering skill is available for your use in solving industrial motor problems. Star Electric Motor Company, 200 Bloomfield Avenue, Bloomfield, New Jersey.



Let Us Help Solve Your Special Problems

Motor-generator set, above, was designed and built by Star to meet special U. S. Navy requirements on voltage, compactness, resistance to shocks and strains. Occupies only half the space required for comparable sets.

Star's record in designing motors and generators for many Navy needs is proof of our ability to solve your difficult motor problems. A standard Star (½8 to 200 H.P.) may handle your job; if it doesn't we'll build one that will Discuss your post-war plans with us now.



STAR MOTORS

POWER PACKAGED AS YOU NEED IT

IF YOU'RE PROUD OF YOUR PRODUCT IT DESERVES



The quality of Ecoa Name Plates reflects the prestige of your product and enhances its sales appeal. Important information for users stays clearly and permanently readable. Ecoa quality costs no more. • We'll gladly quote on your requirements, without obligation. Write us today.

ETCHING COMPANY OF AMERICA

1520 MONTANA ST., CHICAGO 14, ILL.

Metal Name Plates, etched or lithogaphed • Plastic Name Plates, Dials and Panels, lithographed or screened • Etched Metal Scales, Clock Dials, Instrument Panels, Art Novelties, Advertising Specialties • Etched Metal Panels for elevators and architectural uses. (Continued from page 208)

ton University presided. Stuart F. Heinritz, Editor of Purchasing, addressed the group on the topic, "What Is a Purchasing Department Worth?" and led a general discussion on the costs of departmental operations. Bert Ahrens, Executive Secretary of EBA, reported on Washington activities and surplus disposal, and reviewed the new contracts of the Educational and Institutional Cooperative Service.

1 1 1 PURCHASING AGENTS JUDGES IN ADVERTISING COMPETITION

Six purchasing executives of the Metropolitan New York area served on the committee of judges in the Third Annual Business Paper Advertising Competition sponsored by the Associated Business Papers. The judging committees for each of the several classifications in the competition consisted of a purchasing agent, a production man, and an advertising agency representative. The purchasing men were C. C. Shellberg of Wright Aeronautical Corporation, J. R. Taylor of Socony-Vacuum Oil Company, R. V. Elms of Sperry Gyroscope Company, N. O. Aeby of Johns-Manville Company, H. K. LaRowe and J. A. Wiley of the Chemical Construction Corporation.

PAST PRESIDENTS' NIGHT ROCHESTER, N. Y.

The Purchasing Agents Association of Rochester, N. Y., dedicated its February 28th meeting to past presidents of the association, with C. D. Hart, Purchasing Agent of Taylor Instrument Companies in charge of the program. R. C. Sauer, third vice president, and Purchasing Agent for the Will Corporation reports that the reminiscences of the former presidents concerning the history of the local association and that of the National Association of Purchasing Agents, proved highly interesting.

A GOOD SUGGESTION FROM CONNECTICUT

"One of our members has brought forth a good idea and your board of directors would like to know how many of you would like to follow it through, says *The Bulletin*, monthly publication of the Purchasing Agents Association of Conn.

"The suggestion, as made by Frederick D. Houghton of the Ensign-Bickford Company, is that each member company that so desires would be privileged to set up a display of its products at one of our meetings so that the members would eventually become familiar with many of each other's products. It is felt that many companies have a regular display that show its products and would be glad to set it up in a modest way so that it could be looked over before a meeting begins. Most of us are not familiar with the products of many of our member companies and would be interested to see what the

(Continued on page 214)

BUILT TO LAST

Deep in the Black Canyon of the Colorado, rising over 700 seet from bedrock, stands Boulder Dam. The engineers who designed it built it to last.

Plumb tools, too, are built to last. The craftsmen who made them have produced tools that not only last longer, but work better.

Plumb quality means even more than durability. The one-piece head of flaw-lessly tempered steel, the handle of selected close-grained hickory, the hang, and the ease with which it works are the enduring features of every Plumb tool. Fayette R. Plumb, Inc. Philadelphia 37, Pa.

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odnies the PLUMB TOOLS ILLUS-TRATED: Top to Bottom! Noil Hammer, Bell Hatchel, Nammer, Half Hatchel, Shank Ris Michigan Ave.

Quality Comes FIRST

PLUMB
is FIRST in Quality

PLUMB

HAMMERS . HATCHETS . AXES . SLEDGES

If you want a bolt or screw.

ALL OF THESE PRODUCTS ARE STANDARD

Cap Screws

Carriage Bolts

Carriage Bolts -Ribbed Neck

Clips - Wire Rope

Cotters

Dardelet Rivet Bolts

Elevator Bolts

Heel Bolts

Hub and Wheel Bolts

Lag and Skein Bolts

Lockwashers

Lockwasher Screws

Machine Bolts

Machine Screws

Nuts -

HP, CP, SF, Castle, Machine Screw, Lock or Slotted

Pipe Plugs

Plow and Guard Bolts

Rivets

Self-Tapping and Sheet Metal Screws

Set Screws

Sink Bolts

Skein Bolts

Spring Center Bolts

Spring Clip Bolts

Step Bolts

Stove Bolts

Stove or Chair Rods -

Headed and Threaded

Studs

Tire Bolts

Weather-Tight Bolts

• Ask the draftsman, or design engineer, in a plant using bolts in assemblies, to name a few "standard" bolts and he may begin by naming "cap screws, lag screws, carriage bolts, machine bolts, and . . ."then he is likely to stop to consider. Chances are, he has named all those with which he is familiar. But there are a great many more, as the long list of

quite common "standard" bolts listed in the panel above reveals.

For instance, only a farm implement manufacturer would know that there are several types of "plow bolts"-standard bolts with implement manufacturers for generations. Some of these bolts are surprisingly like other bolts not used by implement

THAT MEETS ALL REQUIREMENTS AND IS EASY TO GET USE A "STANDARD" INSTEAD OF A "SPECIAL"

manufacturers, but by slight modification in dimensions and physicals serve other purposes.

Virtually all the bolts and screws used in the gigantic aircraft industry are almost exact replicas of existing bolts and screws used by other industries —excepting for materials of which they are made, more exacting fit and finish.

Frequently a customer designs a "special" bolt or fastening, assuming he cannot get or use a standard bolt. These "specials" require special dies, made of scarce die steels by even scarcer die-makers. Often critical materials are specified when less critical materials properly heat treated, would develop the required physicals. And all "specials" require special routing, handling and inspections throughout every step of their production.

Therefore we say, FIRST-find out from us if there is a standard bolt that may fit into your design. If there is not, perhaps you can re-design for a standard bolt now, saving time later. SECOND-determine if physicals can be met by less critical materials, heat treated to develop full strength. Lamson & Sessions maintains modern heat treating departments with chemical, physical and metallurgical laboratories manned by competent engineers. THIRD-if you cannot use a standard bolt, then call in a Lamson representative to discuss your problem. Out of his broad experience, he will probably be able to help you. And if you must have a "special" bolt tailored to your requirements, we can make it on our bolt-making machinery faster than any other way.

THE LAMSON & SESSIONS COMPANY, General Offices, Cleveland, O. Plants at Cleveland and Kent, Ohio; Chicago and Birmingham



"BOLTS, NUTS & SCREWS"-1944 REVISION. Cloth bound. Limited edition, 180 pages of technical, practical information. Sent prepaid for \$1.00-cash or check must accompany your order.

"BOLTS ARE IMPORTANT!"—24-page booklet of currently useful information for buyers of headed and threaded products, and describing Lamson & Sessions' specialty fastenings which have wide industrial applications —now, and in the post-war period. Sent gratis.

"THE LAMSON BLUE BOOK"—is our standard Catalog of standard products excepting our Aircraft products. Sent gratis.

"SIMPLIFIED STOCK LIST"—Of bolts, nuts and screws, conforming to latest revisions of the Office of Price Administration, and of great value in showing you in what ratio quantities of various standard products are kept in stock for deliveries, by your jobbers and in our own (and other bolt manufacturers') warehouse stocks. Sent gratis.

-HERE'S	A	COUPON	FOR	YOUR	CONVENIENCE-

	ook Bolts, Nuts & Screws (\$1.00) ant! Simplified Stock Sizes
☐ Bolts ☐ Machine	ws and Set Screws Cotters Screws Lamson Lock Nuts her Screws Self-Tapping Screws
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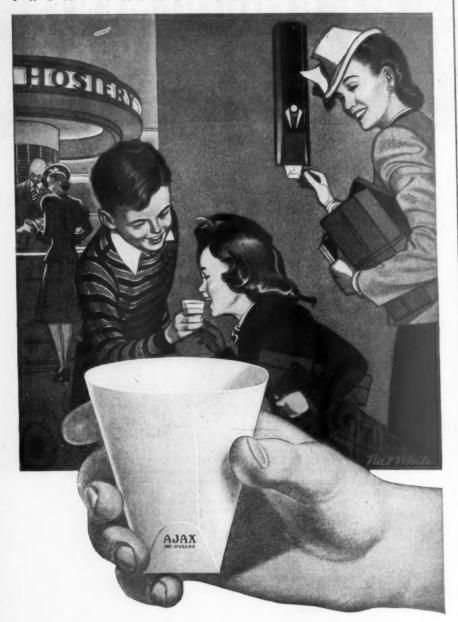
LAMSON & SESSIONS

BOLTS . . NUTS . . COTTERS . . CAP SCREWS . . SPECIALS

Your Jobber Stocks the Lamson Line

APRI

AMERICA DRINKS ITS WATER FROM PAPER CUPS — SAFELY



Only in America can we enjoy safe drinking water everywhere . . . wise management in Department Stores and other public places caters to customer and employee approval by providing one of these four famous paper cups at all water fountains.



STATES EN LINE

LOGAN DRINKING CUP CO. Worcester 5, Mass. PACIFIC COAST ENVELOPE CO. San Francisco 7, Calif.

Divisions of

UNITED STATES ENVELOPE COMPANY

(Continued from page 210)

other fellow's company is making. It could probably be arranged that at each meeting we could set up more than one display, depending upon the amount of room available and size of display."

LARGE ENROLLMENT FOR PURCHASING COURSE

Though it was necessary to reject many last-minute applications for enrollment in the educational course in Principles and Practice of Purchasing sponsored by the Purchasing Agents Association of California, San Francisco, Calif., the opening class held on January 23rd started with an enrollment of 153 students. The course was planned by the association's educational committee headed by Robert Hayden as chairman, and H. W. Christensen as co-chairman, and was presented by the Educational Committee with Professor Royal A. Roberts of the School of Business Administration, University of California, as director. The course consisted of ten lectures.

FROM ONE P. A. TO ANOTHER PROVIDENCE

George A. Renard, executive secretary-treasurer, National Association of Purchasing Agents was guest speaker at the February 26 meeting of the Purchasing Rhode Island Purchasing Agents Association held at the Narragansett Hotel, his talk being presented under the theme "One P. A. to Another. Five membership applications were approved, as follows: Albert G. Berghahn, Armbrust Chain Co. & American Ball Bearing Co.; James E. Brophy, Johnson Automatics Manufacturing Co.; Joseph B. Chestnut, Corning Glass Works; Edward C. Coleman, State of Rhode Island; and Raymond Grunewald, Herreshoff Manufacturing Co.

CINCINNATI PURCHASING AGENTS VISIT WRIGHT AERONAUTICAL

Members of the Cincinnati Association of Purchasing Agents took advantage of the unique privilege of a visitation at the huge plant of the Wright Aeronautical Corp., Lockland, Ohio, February 27th.

GEORGE RENARD ADDRESSES NEW ENGLAND MEETING

George A. Renard, executive secretary of the N. A. P. A., was guest speaker at the March 13 meeting of the New England Purchasing Agents Association, at Shrafft's, Boston. Mr. Renard spoke on wartime and potential postwar industrial conditions and the Purchasing Agent's responsibilities in connection therewith, under the theme 'From one P. A. to Another.' Preceding the dinner meeting, members witnessed a picture showing the processing of frozen foods presented through the courtesy of Birds-

(Continued on page 218)

Again Available . . . Benjamin Porcelain Enamel Steel Fluorescent Units



Again obtainable*, are Fluorescent Lighting units which meet the highest specifications for efficiency, durability, long life and ease of maintenance.

For Benjamin RLM Fluorescent Lighting units with Benjamin Life-Time porcelain enamel steel reflectors are back in production! Now, again, you can secure the unequalled advantages of fluorescent lighting with porcelain enamel** light reflecting units.

Not only do these units bring to you the extra safety factor of strength and durability insured by Benjamin's "built-like-a-battleship" construction; the ease of installation and maintenance features which have long identified Benjamin with economy and lower over-all cost; but also they bring you the latest developments in trouble-free and more efficient auxiliary equipment.

*Subject to existing priority regulations.

WRITE TODAY FOR NEW BULLETINS containing complete descriptions and data on the various Benjamin RLM Fluorescent Units now available. These include Twin and Triple Lamp closed and open-end units for both 48" and 60" fluorescent lamps; also, the Benjamin dust-tight and vapor-tight fluorescent units and the Type "V" non-metallic reflector Fluorescents. Write Product Information Department Y, Benjamin Electric Mfg. Co., Des Plaines, Illinois.

**Experience has proven that there is no substitute for the strength, durability, high light output, diffusion and sustained lighting efficiency of porcelain enamel. It cannot decompose, oxidize or disintegrate. It is impervious to practically all atmospheric conditions obtaining in Industry. Its glass-hard surface cannot be penetrated by dirt nor grime nor worn away by repeated washings. It is the easiest of all reflecting surfaces to clean . . . soap and water quickly restoring it to its original light reflecting efficiency.

BENJAMIN
Lighting Equipment

Distributed Exclusively Through Electrical Wholesalers

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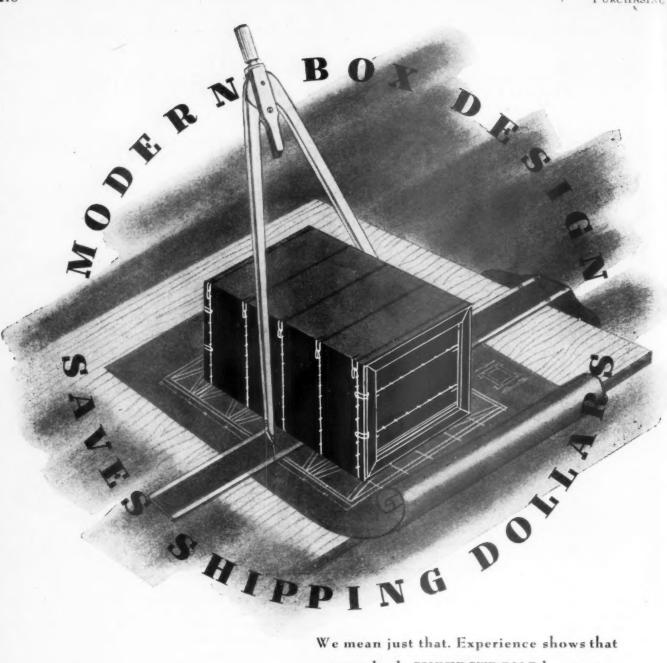
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We mean just that. Experience shows that custom-built SUPERSTRONG boxes save shipping space, save damage loss, save dollars—because they're designed right and made right. We've learned the "know-how" in our ninety years . . . The extra strength and toughness of SUPERSTRONG boxes—"Bound with Steel"—is just an added feature at no added cost.

RATHBORNE, HAIR AND RIDGWAY COMPANY
1440 WEST 21st PLACE . CHICAGO 8. ILLINOIS

HIGH-TENSILE STEE



Inherently finer grain — achieved through the element zirconium together with a balanced composition of carefully chosen alloying elements . . . gives N-A-X High-Tensile Steel properties and qualities that make it a natural choice for mobile equipment. More and more of this great low-alloy steel is "on the move" in the railroad, trucking and other transportation industries, in military vehicles of all types, in varied applications that place exacting demands on materials.

Each desirable characteristic of N-A-X High-Tensile Steel is being used to good advantage. Its greater strength is knocking out dead weight through lighter designs; its exceptional ductility permits fabrication in intricate shapes by efficient methods; its excellent weldability contributes to over-all strength, providing uniformly high resistance to strain and fatigue. We suggest that you get the facts on N-A-X High-Tensile Steel as they apply to your production.

GREAT STEEL FROM GREAT LAKES

GREAT LAKES STEEL

Corporation

N-A-X ALLOY DIVISION . DETROIT 18, MICHIGAN

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Rigid TESTS at every vital step in production quard the dependable QUALITY



TEST PRESSURES FAR EXCEED RATED PRESSURES

Every Lunkenheimer valve is given a thorough test at pressures far above its rated working pressure. Valves are tested on both sides at high and low pressure for seat tightness, and then given a shell test. The slightest leak causes rejection.



Fig. 123 "N-M-D" Globe (Non-Metallic Disc)

BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S.P.; BOILER MOUNTINGS, LUBRI-CATING DEVICES, AIRCRAFT FITTINGS

Nothing is left to chance in producing Lunkenheimer Valves. Exacting tests with the most advanced modern equipment are made at each important point in manufacture. Even final packaging for shipment must meet rigid specifications.

This may be producing valves the "hard way" . . . but for Lunkenheimer it's the right way, since it safeguards a reputation for quality that is our proudest

> Today, with greatly stepped up production schedules, maintenance men appreciate more than ever the rugged durability, efficiency, and longer service life of Lunkenheimer Valves —the less attention and fewer repairs they require.

> Lunkenheimer Distributors are located in all important industrial centers. There is one near you, ready at all times to assist in solving your problems of maintenance and operation.

Fig. 2125 125 lb. S. P. Bronze Gate Double Disc, Rising Stem

ESTABLISHED 1862

THE LUNKENHEIMER CO. "OUALITY"-

CINCINNATI 14, OHIO. U. S. A.

NEW YORK 13 CHICAGO 6
BOSTON 10 PHILADELPHIA 7

EXPORT DEPT, 318-322 HUDSON ST., NEW YORK 13, №, Y.

(Continued from page 214)

eye Frosted Foods. Secretary Graham announced the receipt of six applications for membership.

METROPOLITAN ASSISTANTS CLUB DISCUSSES SURPLUS DISPOSAL

G. E. Chapin of the Reconstruction Finance Committee was guest speaker at the February 13th meeting of the Metropolitan Purchasers' Assistants Club held in Midston House, New York, his subject being "Surplus Disposal."

HAROLD K. HOWE ADDRESSES ST. LOUIS MEETING

Harold K. Howe, manager of the Washington office of the La Salle Steel Company, spoke on "Current Happenings and Trends in Washington", at the February 20th meeting of the Purchasing Agents Association of St. Louis, at the Coronado Hotel.

NATIONAL OFFICERS SWING AROUND THE COUNTRY

President R. C. Swanton of the National Association, and the respective vice presidents of the various District groups of the National Association, have been guest speakers at numerous local association meetings, as follows:

Western Massachusetts Purchasing Agents Association, President Swanton addressed meeting at Hotel Kimball, Springfield, Mass., February 15.

Purchasing Agents Association of Syracuse and Central New York, Hotel Onondaga, Syracuse, N. Y., February 19th. President Swanton, and Vice President E. P. Scully, 8th District.

Purchasing Agents Association of Pitts-burgh, Hotel William Penn, Pittsburgh, Pa., February 20th. President Swanton and Vice President Lee R. Forker, 6th

Purchasing Agents Association of Columbus, Fort Hayes Hotel, Columbus, Ohio, February 21st. President Swanton and Vice President Lee R. Forker, 6th

Purchasing Agents Association of Rock River Valley, Faust Hotel, Rockford, Ill., March 12. President Swanton and Vice President C. M. Oberling, District No. 3.

Purchasing Agents Association of Connecticut, March 27th. President Swanton and Vice President Charles L. Sheldon, District No. 9.

Purchasing Agents Association of New York, March 20. President Swanton and Vice President E. P. Scully, 8th District.

Milwaukee Purchasing Agents Association, Elks Club, Milwaukee, Wis., March 14. President Swanton and Vice President C. M. Oberling, District No. 3.

Twin City Association of Purchasing Agents, St. Paul Athletic Club, March 15. President Swanton and Vice President C. M. Oberling, District No. 3. Formica sound-color picture also shown.

(Continued on page 294)

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THAT'S
ONLY HALF OF IT!

It's the service it gives—the punishment it can take on the job that has "sold" Billings Wrenches to workmen for more than 75 years. They have "what it takes" to withstand the day in and day out beating. They're made for it and sure get it. Yes, it's more than good looks the man on the job knows he gets from Billings Wrenches and Tools.

YOU CAN RELY ON BILLINGS TOOLS

Billings



BUY BILLINGS FORGED TOOLS FROM YOUR INDUSTRIAL SUPPLY DISTRIBUTOR

FORGED TOOLS
THE BILLINGS & SPENCER CO.
HARTFORD 6, CONN., U.S.A.

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HAS THIS ENEMY GONE UNDERGROUND

right in your own office?

How hidden non-productive paper-work costs can affect your company's position and profits, in the years directly ahead!

By actual count, there are some 61 hiding places for excessive, non-productive paper-work costs—even in the average, moderate-sized industrial concern. And they've had plenty of opportunity to hide there during a period when speed of production rightly had a great deal more attention than cost of production.

But management is beginning to realize, as it looks ahead, that it faces the toughest kind of competition both within and from without its own industry. It is beginning to search for ways to produce more for less...the surest way not only to continued growth and profits...but also to high employment and a healthy national economy.

And that means reducing non-productive costs wherever they can be found. After the last war it was in the factory itself where Work Simplification was introduced with streamlining of production. Much has been accomplished there. But the growing burden of costly non-productive paper work...of inefficient systems of control...offers an opportunity for savings that progressive management can no longer afford to overlook.

Where costs . . . and savings . . . multiply themselves

It probably comes as a surprise that direct paper-work costs have almost quadrupled since 1900. Yet inefficiencies that have crept into paper-work procedures, writing methods and form designs affect a great deal more than the $\cos t$ of forms and the labor to process them.

For written records and reports are the Nerve System of business. They start, stop and control every business operation. They guide men, materials and machines. Savings effected in paper work, therefore, multiply themselves throughout the office and factory.

For instance. An important builder of LST's and tanks installed a new Receiving Report system which combined four writings of as many separate records into one. Simplification of paper work allowed receivals to be recorded within two hours, ended material delays of as long as four days; control permitted lower inventories to be maintained.

Where you can look for help

The Standard Register Company, through its broad experience, unusual facilities and sound techniques, has helped effect savings up to five and six figures for hundreds of leading companies, large and small. Our approach follows a step-by-step plan which gets at the facts and arrives at the answers in a minimum of time. And without upsetting office routine.



THE STANDARD REGISTER COMPANY

Manufacturer of Record Systems of Control for Business and Industry . DAYTON 1, OHIO

Pacific Coast: Sunset McKee-Standard Register Sales Co., Oakland, California. Canada: Crain Printers, Ltd., Ottawa, London: W H. Smith & Son, Ltd.



Multiple Purpose Requisition and Purchase Order

STEAD, Purchasing Agent, Fabricating Division, Bridgeport Brass Co., Bridgeport, Conn., contributes the multiple purpose requisition form, and the simple compact purchase order form presented on this page.

He states that "the multiple purpose requisition form", which bears the title "Stores Purchase Requisition", can be used for all items carried in the stores department and for items of component parts ordered frequently for production. Complete specifications of the article or part are typed on the form by the stores or production departments. The buyer merely indicates which of the several vendors listed is to be favored with the order.

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"In addition to giving a record of previous purchases of the particular article, the form saves the necessity of typing a new requisition each time the item is ordered.

"The requisition form is returned to the stores or production departments after the purchase order has been issued. It bears a record of the date, vendor, purchase order number and quantity which has been ordered.

Purchase Order

"The purchase order form, though compact, provides ample space for specifications for an average order. To save typist's time, the snap-out carbon feature is employed. Sufficient copies are provided for the purchasing department, receiving department, cost and priority departments.

"While the order is unfilled, the duplicate copy serves as the purchasing department record, the fifth copy as a follow-up or tickler copy and the tripli-(Continued on page 222)

ITEM N		LUNIT	1	KR TO		HANGE T	o .		BRIDGEPORT BRASS COMPANY STORES PURCHASE REQUISITION												
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Front and reverse of Multiple Purpose Requisition used by Fabricating Division, Bridgeport Brass Co., Bridgeport, Conn. Actual size of the card is 5" deep by 8" long. It eliminates need for writing requisition each time the item covered by the form is wanted.

The Purchase Order form, though compact, provides ample space for specifications for an average order.

Purchase Order Change Notice is printed on blue stock, and bears the line "Purchase Order Change Notice" in red immediately under "Bridgeport 2, Conn."; "Change on Order" immediately over order number, and the words "Change Notice" in red Outline type diagonally on body of form.

URCHASE ORDER	BRID	BRIDGE	T BRAS EPORT, 2, C CATING DIVIS	
			PLEASE MAIL IN	NVOICE ON THE DATE OF SHIPMEN
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				POR SEPT.
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- 10 EAST	MAIN STREET	PLANT		
₩ VIA				BRIDGEPORT BRASS CO.
RM 290A-REV.	D SEE RI	VERSE SIDE FO	R CONDITIONS	PER
				PURCHABING ADDIT

APRIL, 1945

UP against 'Sticky' — that clinging, smeary gremlin in pencil carbon paper? You can banish the inconveniences usually connected with pencil carbon writing by using Columbia Nonstick Pencil Carbon Paper.

Non-sticking, curl-resisting, clean to use regardless of moisture and climate, and even out in the weather, Columbia Nonstick Pencil Carbon Paper is economical, tough, long-wearing. Think of all the instances in which such a carbon paper will serve most efficiently for writing duplicates of sales and delivery receipts, all types of orders, stock lists, layouts, diagrams. Ask your dealer or the Columbia office nearest you for a demonstration and prices.

NONSTICK CARBON PAPER

COLUMBIA

RIBBON & CARBON MANUFACTURING CO., INC.

Main Office & Factory: Glen Cove, L. I., N. Y.

NEW YORK + KANSAS CITY, MO.
CHICAGO + DETROIT + MILWAUKEE
MIN N EA POLIS - NASHVILLE
PHILADELPHIA + PITTS BUR GH
PORTLAND, ORE + CINCINNATI MARKIL MOIRS
Also: London, England; Sydney, Australia

cate and quadruplicate copies are used by the receiving department.

"When the order has been completed the duplicate copy is priced and filed according to commodity as the purchasing department's permanent record. This serves as a price and commodity file for future reference. The triplicate copy is

	PEE	CEIVING RECORD	
ATE EC D	QUANTITY	ARTICLE	YIK
-	-		
-		***	

Receiving record on Reverse of Form is printed the length of the form, and is 8" long by 5" wide.

forwarded to the purchasing department upon receipt of the goods; it is priced and sent to the cost department as a part of the cost record.

"A complete receiving record is kept

by filing the quadruplicate copy in a completed file in the receiving department. Suitable notations are made on the triplicate and quadruplicate copies by the receiving clerk giving information regarding date of receipt, number of pieces, weight, method of transportation, etc.

"Space is provided on the reverse side of the duplicate, triplicate and quadruplicate copies for recording partial shipments. After the goods have arrived, the follow-up copy has no further value as such but can be used as a priority record and filed according to purchase order number in separate sections for MRO—CMP—P.D. 3A—PD-541, etc.

"The necessity of writing notes and letters can be eliminated by the use of change order which is similar to the purchase order form. It is plainly marked 'Change Order' and is of a different color paper for easy distinction. A copy is provided for each copy of the purchase order. It can be used as a cancellation notice, change in quantity, price, specification, point of delivery, method of shipment, etc."

Emergency Purchase Order Form

ERE is a set of three forms, Requisition, Purchase Order, and Emergency Purchase Order used by the State Highway and Public Works Commission of North Carolina, Raleigh, N. C. These

Works Commission of North Carolina uses three rather simple sets of requisitions and purchase forms for issuing an average of approximately 30,000 orders per year for supplies, materials and

FORM 780 12M-5-8-43-D.P.C. 19797			Retained by Po	trebasing Departmen							
STATE HIG	DIVISION OFFICE REG GHWAY & PUBLIC V TO PURCHASING DEPA	VORKS COM	MISSION								
Raleigh,	N. C	194									
At	Via	******									
6.	License No.	Motor	No								
QUANTITY	DESCRIPTION	CAT. NO.	UNITPRICE	TOTAL PRICE							
Actual Diz	9 8 × 11"										
BACK ORDER MADE-I	DATE BY	TOTAL									
Date Shipped		roved	******								
	ORDERED FROM:	DATE	ATE Order No								
APPROVED FOR PURCHASE:			*********								

were furnished by J. M. Potter, Purchasing Agent, who also supplied the following information in regard to the forms and their use:

"The State Highway and Public

equipment, amounting to approximately \$8,000,000. Requisitions may originate from any one of the several engineering and administrative departments lo-(Continued on page 224)

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Simple facts about the mechanics of contract windups explained clearly in one booklet, "The ABC of Contract Termination"

What paper work is needed

Even the apparently complicated, time-taking procedures involved in contract terminations can be reduced to relatively simple terms. You'll find an easy-to-read outline of paper work requirements and a sound method for meeting them in our new booklet offered here.

How to plan your internal contract

termination organization

The basis of this method is the use of the Mimeograph* duplicator. In addition to its other advantages in this application, and they are considerable, it has a unique answer to a

paramount requirement:

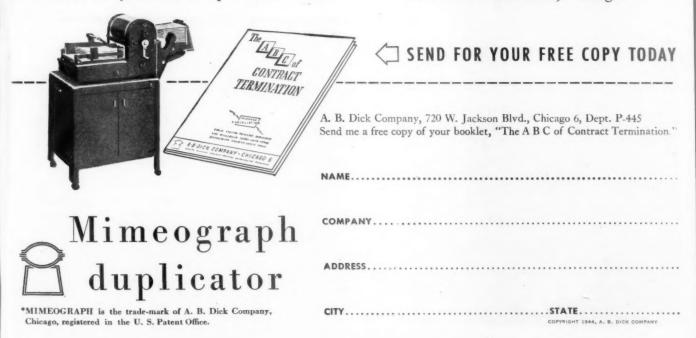
that copies of all paper work be clearly legible for a period of years.

How to produce this paper work quickly, com-

pletely, in keeping with government requirements

The crisp, black-on-white copy produced on the Mimeograph duplicator with Mimeograph brand supplies is *permanently legible*. It will not smudge or fade in spite of constant handling, weather, exposure, oils, and other chemicals common to industrial plants.

A. B. DICK COMPANY, Chicago.



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mately iginate gineerits lo-

APRIL





PAPERS made from 100% new white cotton cuttings save critical war materials. Yet the most durable L. L. Brown ledgers*, instead of ordinary papers, add less than 1% to accounting costs, yet guarantee 100% protection—utmost resistance to wear. Ask your printer for samples of the following:

L.L.BROWN LEDGER PAPERS

- * L. L. BROWN'S LINEN LEDGER 100% New White Linen & Cotton Fibres
 - *ADVANCE LINEN LEDGER 100% New White Cotton Fibres

FORWARD LINEN LEDGER 100% New Cotton Fibres

L. L. BROWN'S FINE 85% New Cotton Fibres

G REYLOCK LINEN LEDGER 75% New Cotton Fibres

ESCORT LEDGER & MACHINE POSTING 50% New Cotton Fibres

* Permanent Papers

L. L. BROWN PAPER CO.

ADAMS, MASS.



(Continued from page 222)

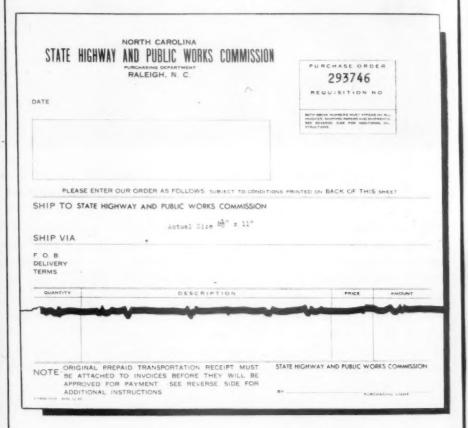
cated in Raleigh or from any of the ten major divisions located at various points throughout the state. All regular purchase orders are issued from the central Purchasing Department in Raleigh while Emergency Purchase Orders are normally issued by the using department or division.

"The Requisition: The requisition form illustrated is used both as a purchase or stock requisition. This form is serially numbered and coded for each division or for the Raleigh Departments. It consists of an original and four colored copies.

"The original copy is filed numerically

orders are written on an electric carriage fan-fold typewriter.

"The original copy of this goes to the vendor. The second or numerical file copy is filed by the purchasing department in separate folders which are numbered the same as the order number. A complete record of the purchase is kept in this folder. The third and fourth copies of the order are sent to the division or department from which the requisition was made. The third copy is used as a material-received report by the requisitioning department, and the fourth copy is filed in this department's requisition file. The fifth copy is filed in the purchasing department's alphabetical vendor file. This



in the purchasing department's requisition file. The second copy is filed in the purchasing department's order number file. The third copy is used as a material received report by the requisitioning department in which case the requisition is for stock items. The fourth copy is used as a packing slip in case the requisition is for stock items. The fifth copy is retained by the division or department issuing the requisition and is filed numerically.

"The Purchase Order: The purchase order form is a five part form with one time carbon interfolds. Space for all essential information pertaining to the order is available on the face of the form. General conditions and instructions are printed in light ink on the reverse side of the original copy. These forms are of the continuous fan-fold type and

file is used as a cross reference and often 'saves considerable time in tracing an order when the number is not available but the vendor's name is known.

"Emergency Purchase Order: This form is also serially numbered and separate series are sent to the various departments or divisions. It is mainly used for purchasing perishable items such as fresh foods in the Commission's prison camps which are located in approximately ninety points scattered throughout the state. Emergency purchase orders are issued by camp superintendents or department heads. The original copy goes to the vendor. The second and third copies, to which are attached approved invoices, are sent to the purchasing department. The invoices are checked and approved by the purchasing department

(Continued on page 226)

Do You Keep "Stop-and-Go" Records?



STOP! Juggle carbons, align sheets, insert the forms.

GO! Type the records.

And then stop and begin the same time-wasting process again. It's just such stop-and-go record writing that puts the kinks in modern business procedure . . . repetitive operations that put a slow-up on work all along the line.



Keep the typist typing

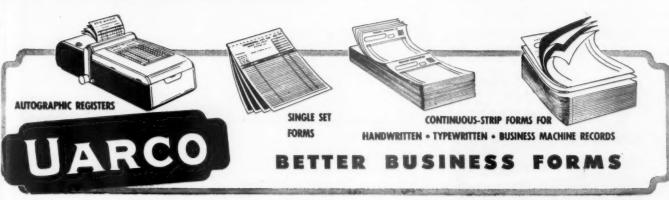


Keep the typist's fingers at the keyboard where they belong . . . with Uarco continuous-strip forms. These forms, already interleaved with carbon, automatically feed the typewriter . . . eliminate carbon fuss and bother, aligning trouble and wasteful inserting motions. Uarco continuous-strip record forms put an end to the "stop" in record writing.

Uarco continuous-strip forms are scientifically designed to speed the flow of work by giving up-to-theminute data on every business transaction. They lessen the possibility of error, eliminate duplication of effort and improve departmental co-ordination throughout the organization.

It will cost you nothing to have a Uarco representative call and work with you . . . help you co-ordinate your work with more efficient records. Call a Uarco business representative today . . . or write for further details.

UNITED AUTOGRAPHIC REGISTER COMPANY Chicago, Cleveland, Oakland • Offices in All Principal Cities



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APRIL,

HOW TO SHIP SMALL PARTS

QUICKLY · SAFELY · ECONOMICALLY





*SLIGHTLY HIGHER WEST OF ROCKIES

In many plants the packaging and shipment of small, intricate repair and replacement parts is quite a problem. But, Ace has the answer. You simply place the parts in a bag, clip the opening with Ace Staplers and all your difficulties are quickly, safely and economically solved. This is but one of the many tough jobs Ace Staplers are doing every day in thousands of factories and offices.

SOLD THROUGH DEALERS EXCLUSIVELY

ACE FASTENER CORPORATION 3415 North Ashland Ave., Chicago 13, III.



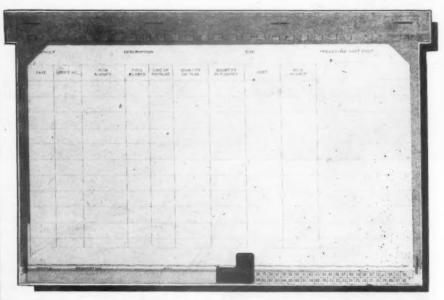
PRISON I	DEPARTMENT BRANCH OFFICE GAMP NO	E. P. O.	Nº 1	2827
TO:	10	BILLING: INVOICES OUR ORDER NUMBER THE BRANCH OFFICE ORDER IS BIGHED, IN BE TO GUARTITY AND PAYMENT: PAYME LY PROM RALEDOR BRANCH OFFICE. TO DISCOUNT, THE CALCULATED FROM OPPICED INVOICES A OUR CALCULATED FROM OPPICED INVOICES A	ABOVE MUST E AND ADDREE OFFICIAL BY VOICES MUST) PRICE. NT WILL BE M DFFICE AFTER PROVAL OF I IN ALL INVOICE DISCOUNT PER DATE CORRE	BE SENT TO HE WHOM THIS BE ITEMIZED ADE PROMPT-RECEIPT OF NYOICES BY LES BUBLECT TOD WILL BE LT AND AP.
SHIP TO: STATE HIG ATTENTION: ADDRESS: SHIP VIA:	Actual Size $\theta_{i}^{k,n} \times 11^{n}$,
F. O. B.	*			
F. O. B. DELIVERY: TERMS:				14
F. O. B. DELIVERY:	DESCRIPTION		PRICE	*MOUNT

(Continued from page 224) before payment is made. These two copies of the Emergency Purchase Order are filed in the purchasing department alphabetically by the vendors and by the ordering departments for a ready crossreference. The fourth copy is retained by the ordering department."

Visual Aid in Controlling Supplies

E. P. DANESE, SR., Purchase Controller, United States Maritime Commission, Jacksonville, Fla., who, incidentally,

supplies bought by the shipyard's purchasing agent whose purchases he is required to approve for reimbursement



is president of the recently organized Purchasing Agents Association of Florida, developed the accompanying form, which he styles a visual aid in controlling

from U. S. Maritime funds.

He explains that the numerals at the right on the bottom represent hull num(Continued on page 228)



Reliability

CHARTING a course or transferring ideas into workable plans calls for reliable instruments which one can trust. Among these is the drawing pencil—great in productive capacity when it measures up to precision standards.

VENUS Drawing Pencils are engineered to give you drafting perfection without failure: accurately graded to assure uniformity in all 17 degrees...strong in performance...smooth and clean in action.

Put VENUS to the test on your drawing board.
Send us a postcard or a

DRAWING PENCILS

AMERICAN LEAD PENCIL COMPANY, HOBOKEN, NEW JERSEY

Put VENUS to the test
on your drawing board.
Send us a postcard or a
note for two free samples.
Specify degrees wanted.



The makers of WESTON paper have devoted their entire skill, experience, research, manufacturing and testing resources for several generations to the one purpose of creating a complete range of papers worthy of the responsibility for carrying and protecting those business records that are worth keeping.

As you value your records take the simple precaution to place them on paper made specially for the job - WESTON paper. Your supplier will recommend the particular kind and grade of Weston paper best fitted for each record keeping purpose.

Weston Makers of Papers for Business Records

(Continued from page 226) bers for which purchases are made. All ship construction material is identified on the plan by a piece number and requisitions are tied in accordingly.

Requisitions submitted to his office for approval are posted on these cards, one for each article bought. The color slide (red) at the bottom moves up to keep pace with the number of hulls provided for. The last number shown is "82", indicating the total number that the yard is authorized to contract for under the current program, the slide showing at a glance that further purchases of the same article are unauthorized.

VICTOR ANNOUNCES TWO **PROMOTIONS**

M. S. Bandoli, Vice President in Charge of Distribution for the Victor Adding Machine Co., has announced the appointment of R. W. Drayton and C. B. Acox to new posts.



R. W. Drayton

Mr. Drayton has been named Supervisor of Branches and will serve as liaison between the branch field organization and the Home Office. Previously he was Manager of the Company's Philadelphia Branch and before that served in a number of capacities. Mr. Drayton brings to his new assignment a well rounded experience in branch operation.



C. B. Acox

Mr. Acox will act as Supervisor of the Dealer Department and will be responsible for all contracts between the Home Office and Victor dealers throughout the country. He will also serve as liaison between the Regional Managers and the Home Office. Mr. Acox has been associated with Victor for the past five years and served in a number of capacities in-

(Continued on page 230)

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PAPERS FOR SOCIAL CORRESPON: PAPER FOR DENCE BONDS AND SECURITIES' BIBLE PAPERS CIGARETTE PAPER PAPERS FOR DEEDS INSURANCE POLICIES DOCUMENTS CURRENCY PAPER WEDDING PAPERS TRACING PAPER CARBON PAPER FIBRES OF COTTON AND LINEN

CRANE'S FINE PAPERS

MADE IN DALTON, MASSACHUSETTS . SINCE 1801

ROOTED DEEP IN QUALITY

PAPERS FOR

BUSINESS

LETTERS

FORMS

The family of Crane's Fine Papers stems from the deep-rooted and time-tested quality of cotton and linen fibres, the most enduring materials from which paper can be made. • From these fibres, and with a craftsmanship that comes from 144 years of experience, Crane makes papers for many uses: business, personal and social correspondence; stocks, bonds and the currency of many nations; documents, deeds and insurance policies; and for the War Bonds we buy that victory may be ours and our future made secure. • Since all Crane papers are made from cotton and linen fibres only, the Crane watermark is your unfailing guide to enduring quality; to papers that will serve you with distinction today - carry forward your words and records into the years ahead.

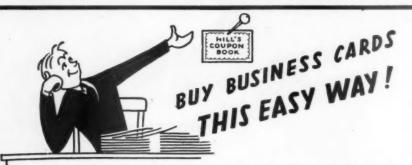
When you want to KNOW ... go to an expert!



In the matter of buying paper, your expert would be your printer. It takes the finest paper to get the best printing results—which explains the reputation Rising Papers have earned among these experts. You'll also find Rising technical papers have a similar acceptance in their own fields. Rising Paper Company, Housatonic, Mass.

Ask your printer...he KNOWS paper!





Once each year, get enough coupons to take care of your whole year's requirements (the coupons come in books and denominations to fit your particular needs). Then, when someone wants business cards, just send Hill enough coupons to cover the desired quantity. Instead of the usual time consuming detail, often as much as on a big purchase, there's but one purchase order to issue, one invoice to check, one transaction in your auditing department—for an entire year.

GET DETAILS NOW-TEAR OUT AND MAIL!

• This simple, practical idea will save days of work in 1945.

HILL INC.

Engravers and Thermographers

Business Cards—Letterheads—Announcements—And other "Ambassadors to American Business" R. O. H. HILL, INC. 270 Lafayette St., New York 12, New York

At no obligation, please let me have details on your coupon book system for the purchase of business cards.

ADDRESS_

(Continued from page 228)

cluding that of District Manager. Previous to his association with Victor, Mr. Acox had been in the home appliance field as a representative for one of the large oil companies.

INKSTAND HAS PLASTIC FITTINGS

Top and interior fittings of self-closing inkstands, product of the Sengbusch Self-Closing Inkstand Co., Milwaukee, Wis., are molded in five pieces of black Tenite



New Sengbusch Inkstand

plastic. The five pieces are fitted together to form a unit which adjusts itself to the ink supply. The stands are said to be airtight and dustproof, and it is claimed that the ink will not evaporate from them. The plastics parts have a lustrous, permanent finish that is easy to clean.

CEILING PRICES ON SYNTHETIC RUBBER BANDS

1 1

Dollar-and-cent ceiling prices have been established for buna-S synthetic rubber bands, the Office of Price Administration announces.

The ceilings, which became effective February 17, 1945, are at the general levels prevailing during the first quarter of 1942, but lower than the prices of some sellers who raised their prices when production of rubber bands was stopped and keen demand developed for inventory supplies prior to March 1942, OPA said.

The manufacture of rubber bands has been recently authorized, and ceilings are now established for all sellers. The bands are now being made of buna-S synthetic rubber.

One table of ceilings is established for manufacturers and wholesalers. It is customary for wholesalers to sell from manufacturers' price lists. Another table of ceilings applies to dealers, including stationery stores and other retailers.

The table for manufacturers and wholesalers applies to 17 standard sizes of rubber bands. Simple rules are provided to calculate the ceiling prices, for other sizes using this same table. Different ceilings are listed, depending on volume of purchase. The lowest ceilings are for purchases of 500 pounds and over with highest ceilings set for the smallest volume purchases. Seven package sizes are listed.

The table for dealers, including retailers, applies to all sizes of bands. The

(Continued on page 232)

Figur strand

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IT ALL ADDS UP



Figure on Underwood Sundstrand to pay back its modest cost ... many times over ... in the hours it will add to your employees' days.

The simple, speedy operation of this time-saving adding-figuring machine is helping thousands of stores, banks, offices and factories to transfer valuable man hours to other uses.

"One-hand touch operation" is

quickly acquired after a few minutes practice . . . because there are only 10 figure keys to reckon with.

With only 10 numeral keys, all grouped under the finger-tips of one hand, there is no need to hunt for a key... no need for swinging

the head and eyes from the work to the machine and back again.

No matter how you figure it . . . it all adds up to Underwood Sundstrand.

Underwood Sundstrand Electric Adding-Figuring Machines are available subject to War Production Board authorization.



Copyright 1945 Underwood Elliott Fisher Company

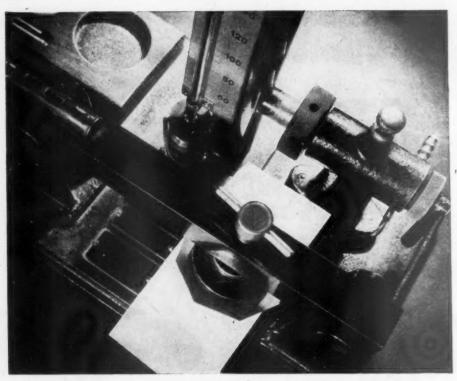
Save the Seconds and You Save the Day

Underwood Elliott Fisher Company

One Park Avenue, New York 16, N. Y.

Makers of Underwood Typewriters, Accounting Machines, Adding - Figuring Machines and Suppli-

APRIL,



Surface facts promise smooth going

As you look, a column of mercury falls inch by inch in this precision instrument and tells whether a sample of paper has the exact degree of smoothness to meet the standard set for Hammermill Bond. Eighteen such scientific tests safeguard every quality in the Hammermill Bond that goes to work for you.



"It's a pleasure to work on this paper. It's so easy to write on-what I write is clear and easy to read. I noticed the difference the day we started using Ham-mermill Bond. That's the reason we'll stick to this paper from now on."



Look for the watermark, and be sure it says "Hammermill Bond." That's the only test you need to make when you select paper. Hammermill has made all the other tests to make sure the paper will perform properly in your office.



(Continued from page 230)

ceilings depend on size of package and volume of purchase. The dealer ceilings on purchases of one to four pounds range from \$1.50 to \$2.50 per pound. On purchases of 500 pounds and over, the ceilings range from 89 cents to \$1.26 a pound. Four package sizes are listed.

To take care of small retail sales, provisions are inserted that the ceiling per quarter-pound box is 50 cents when the sale is for less than one pound.

Representative members of the industry were consulted in the establishment of the new ceilings.

(Amendment No. 18 to Maximum Price Regulation No. 220—Certain Rubber Commodities).

BONDS, PLASTICS, METALS, WOOD AND PLASTIC MATERIALS

A new rubber cement, named Plastilock 500, a non-thermoplastic, water and aromatic oil-resistant adhesive for bonding metals, wood, plastics and ceramic material to themselves or to each other is announced by The B. F. Goodrich Com-



A plastic material joined to aluminum by Plastilock 500, showed satisfactory adhesion at the bond in this test. Bond held, while the plastic was torn away.

pany, Akron, Ohio. The company claims it provides superior bonding qualities in any of its applications, and in some cases can be used in place of rivets or screws.

In using Plastilock 500 the company advises that best results are gained by applying heat with pressure, although heating alone will give some degree of adhesion. Purpose of the pressure is to obtain good surface contact. The bond strength varies with the materials being adhered.

The new adhesive, used for metal-tometal bonding, has shown a shear strength of 3,250 pounds per square inch. Tension strengths of 4,000 pounds per square inch have been reached. Tests made after the bonding of wood and plastic to aluminum, which presents extremely difficult problems of adhesion to other materials have resulted in the wood and plastic being torn because the strength of the bond was greater than that of these materials.

1 1 1 CRAFTINT SKETCHING BLOCKS

Originally designed to meet the requirements of draftsmen and engineers in war plants, Craftint Sketching blocks which are designed especially for field

(Continued on page 234)

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There's a good-purchasing story in your wife's pocket book

... from the records of

ARRINGTON Manufacturing Company



"By rights we ought to have a good purchasing operation here in our plant," says D. H. Farrington, Vice-President of the Farrington Manufacturing Company, Boston, "because we invented and developed the Charga-Plate System that simplifies purchasing for department store customers everywhere.'

Fair enough. Especially when you appreciate how easily this company administers its great volume of purchasing for war-production activi-

ties-with Kardex.

Farrington's Kardex simplifies buying at the right time, in the right quantity, at the right price. Perfect control of every operation is assured -from the original request to purchase, to the final purchasing departmentapproval of the covering invoice.

Quick reference, quick posting and visible control are advantages of Kardex that can also help you to carry on the routine and administration of buying most effectively. Send for our valuable 64-page free book "Purchasing Department Records & Routines," from our nearest Branch Office.

VENDOR'S RECORD ... Shows Farrington Purchasing officials at a glance where to buy what, shipping data, and other needed in-

PURCHASE HISTORY . . . This card is combined with a perpetual inventory record for regular consumption items. A guide to sources and times in buying.

C M P CONTROL ... Provides a simple yet adequate allotment accounting. Shows source and distribution of raw materials by quarterly

M R O CONTROL . . . Shows at a glance amounts available for balance of each quarter, facilitating compliance with Government requirements.

BUDGET CONTROL . . . Another valuable administrative record. Master Cards for each product are followed by the proper Raw Material Cards. Budget Control Work Sheets are inserted integrally with the record.

SYSTEMS DIVISION

Buffalo 5, New York



No. 370 TRI-POST DESIGNERS PAD

75 sheets of Tracing Paper Size 8½ x 11 6 Scale Combinations: inch, tenth, eighth, quarter, half—and isometric with eighth inch scale.

List Price . . . \$1.50



The Frederick Post Company

P. O. BOX 803 CHICAGO 90

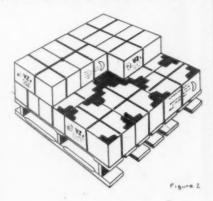
KEYSTONE 7000

(Continued from page 232)

work and eliminate the use of rulers and T-squares, are being marketed by the Craftint Manufacturing Co., 210 St. Clair Ave., Cleveland, Ohio. Each Craftint sketching block has a patented cover with 1/10 inch, ½ inch, ¼ inch and ½ inch scales, plus an isometric chart over a ½ inch scale—all stitched in a non-slip arrangement. The pad is 9" x 12" and contains 75 sheets of tracing vellum.

GLUE FOR PALLETIZING FIBER SHIPPING CONTAINERS

In collaboration with the Army Quartermaster Corps, National Adhesives, 270 Madison Ave., New York, has developed a special quicksetting mold-proof glue for palletizing corrugated or solid fiber shipping containers, which has been approved by Headquarters, Army Service



Forces and Navy Department, Bureau of Supplies and Accounts.

The glue is identified as Pallet Adhesive #4, and is designed to provide high shear strength, which prevents the side slipping of units comprising the load-in combination with low tensile strength which permits the easy separation of cases for distribution. Application is made by brush to the perimeter of the wooden pallet, and in an L-shaped pattern to the upper four corners of each container in contact with another layer as shown above.

Test hauls demonstrated that Adhesive #4 provides adequate protection against all the stresses of domestic shipping and freight handling. Use of the palletizing glue is said to make for saving 50% on strapping requirements, and important saings in man hours all along the supply line.

1 1 1 SHORTAGE OF BAGS

There probably will be fewer paper grocery and variety bags, shipping sacks, wrapping papers, envelopes and certain converting papers available to the public in the second quarter of this year, members of the Kraft, Special Industrial and Sulphite Paper Industry Advisory Committees were told by War Production Board officials at a recent joint session.

Shortages of domestic wood pulp for the second quarter, beginning April 1, require a curtailment in allocations 10

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Drawn by EDW. A. WILSON. "Ranging the Maine Coast"

A WELCOME BEACON

Paper, one of the most critical war materials, must be conserved until the shoals of war are safely behind us.

Yet the very wartime restrictions have done much to strengthen the paper industry. They have brought mills, distributors, and users of paper together in a note-worthy spirit of cooperation. They have highlighted for the buyers of printing, as never before, the versatility of paper; the importance of choosing

the right paper for each individual job.

These gains are a bright beacon for the days ahead . . . they point the way to clearer sailing ahead for the entire paper industry.

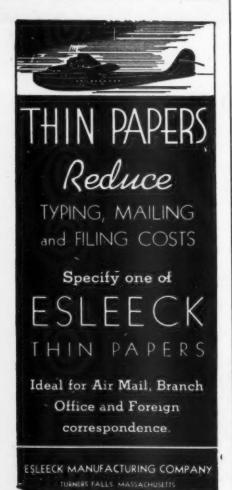
International Paper Company, 220 East 42nd

Street, New York 17, N.Y.



APRII





No Relief In Paper Shortage Until Long After V-E Day

The Magazine and Periodical Industry Advisory Committee recommended at a recent meeting that the War Production Board consider the relationship and distinction between the paper production orders and the limitation orders affecting the use of paper in printing and publishing when relaxation or revocation of any of these orders is contemplated after "Victory in Europe" Day, WPB reports.

Printing and publishing orders, the committee pointed out, restrict the usage of printing paper to definite tonnages, whereas production of other pulp products is controlled only by the amount of pulp allocated to the paper and board mills from the pulp pool. In the event of any increase in the available pulp supply or a decrease in military paper demands, no increase in printing paper usage is permitted unless the orders are amended. On the other hand, committee members pointed out, if the control and allocation of pulp under M-93 is continued, any relaxation of production orders making more pulp available will be reflected immediately in production of other than printing papers.

WPB officials indicated a careful study of all orders would be made before any relaxation or revocation of paper orders

was undertaken.

After having a report by Army officials to the effect that wood pulp requirements for making smokeless powder will be reduced after "V-E" Day, the advisory committee recommended that the former authorized use of the affected grades of pulp, which have been held in reserve for nitration use, be restored to the paper mills within 30 days after "V-E" proportionately in the segments of the industry from which it was originally withheld.

The committee recommended that WPB take steps to obtain information on the quantities and grades of pulp that may be imported after "V-E" Day from European sources, particularly from Sweden.

The committee also sought to learn what action would be required to expedite pulp importation immediately after "V-E" Day. If and when foreign pulp and pulpwood become available, it was recommended that the previously authorized use of market pulp be restored to the various segments of the paper making industry in proportion to the curtailments suffered by such segments

since January 1, 1943.

A study of the pulp and paper situation presented by WPB's Pulp Allocation Office revealed that retention of the pulp allocation order M-93 was planned, but that it might be revoked when adequate supplies of wood pulp become available, or when imports reach 1,500,000 tons a year. Any increase in available pulp, it was explained, will be distributed to mills in a manner similar to the previous withholding.

The necessity of continuing the drives for increased cutting of pulpwood and collection of waste paper was emphasized in view of the uncertainty of any relief from other sources. Attention was called to the desirability of having the many types of papers sorted and segregated before collections are made, and the necessity of having all paper and board suitably baled or at least tied up securely in as large packages as possible. It was indicated by WPB that efforts to secure some additional baling machines for baling paper were being made, and that a few machines would soon be available.

Officials expressed the opinion that

there would be little relief in the paper shortage until several months after "V-E"

1 1 1 SAFE AND FILE PRODUCTION UNDER PR 25 LIMITED

Production of safes, safe deposit boxes and insulated files under the "spot authorization" procedure (Priorities Regulation 25) is expected to total much less than the amount authorized, War Production Board officials said at the recent meeting of the Safe and Insulated File Industry Advisory Committee.

As a result of stepped-up demands for critical materials to make military items, WPB representatives explained, the amount of material available from mills and warehouses on the Z-1 (deferred) allotments assigned to manufacturers in connection with "spot authorizations" is extremely limited. Orders on "deferred" allotments cannot be filled until other

orders have been filled.

The recently issued Limitation Order L-13-b (controlling the use of metal in furniture and fixtures) effect no changes in the controls over production of sales and insulated files, WPB officials said. As before, they pointed out, safes and files may be made only to fill preferred orders, except as authorized under PR-25. Preferred orders are those placed by the Amy, Navy, Veterans' Administration, United States Maritime Commission and the War Shipping Administration.

A representative of the War Manpower Commission emphasized the acuteness of the manpower shortage. In some localities, he said, it has become necessary to transfer workers classed as being engaged in "essential activities" or as "locally needed" to plants where they are more urgently needed. This is accomplished by lowering manpower ceilings or through the voluntary cooperation of employers, the WMC representative said.

1 1 1 TO DETERMINE DIRECTION OF PAPER GRAIN

To determine the direction of grain in paper, bear in mind that there are two major directions of paper, says Multigraph-Lithograph News, defined as fol-

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Plan on using 90,000 "MAIL" Salesmen

Be sure that your post war plans include direct mail contacts with your customers—old, new and prospective.

They're making post war plans themselves, and they want to hear about yours—maybe they've already heard about your competitors'.

Tell them about your products and your sales plans! Keep your bid for future business in active circulation.

While you may have little to sell, and your salesmen may be few, let the "MAIL" Salesman travel for you. There are 90,000 Postmen calling

daily on the very people you want to reach. *Use them,* and have customers on the dotted line when you've something to sell again.



TENSION KNOWS HOW
to make better envelopes for
every business need—and
Tension envelopes have carried
the vital communications of
thousands of important
industries for over 60 years.

Manufacturers Selling Direct to the User FNVELOPES

TENSION ENVELOPE CORP. • *MINNEAPOLIS 15, MINN., 500 S. 5th St.

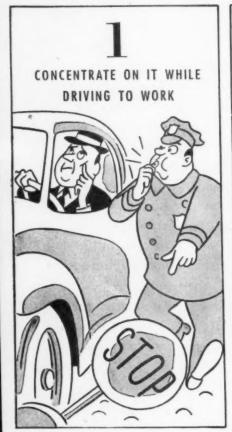
*DES MOINES 14, IOWA, 1912 Grand Ave.

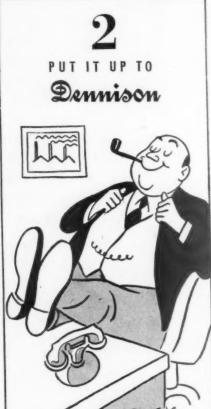
*ST. LOUIS 3, MO., 23rd & Locust Sts.
*KANSAS CITY 8, MO., 19th & Campbell Sts.
*Originally Berkowitz Envelope Co.

APRIL, 19

Two Ways to Solve

Your Product Marking Problem





Right now you're up to your ears in war production. But you probably are still thinking about a new product to be made when peace comes. You're also probably thinking about marketing that product...how to trademark it, package it or how to get your story across at the point of sale, among other things.

That's where Dennison comes in. Whatever your marking problem, remember there's more than a century of specialized experience at your beck and call here in Framingham. So when the time comes, put your problems up to

Dennison

PAPER PRODUCTS FOR MORE THAN A CENTURY



We'll be glad to help you plan today the special tags or labels that can be manufactured tomorrow. Present production at Dennison is given over to war work, but development work with the leaders of American industry still goes on. Evidences of past performances are given in an interesting booklet on product marking and identification. Get the coupon that will bring yours to you in the mail today.

TAGS . LABELS . SET-UP BOXES . MARKING SYSTEMS . PAPER SPECIALTIES

Dennison Manufacturing Company 79 Ford Ave., Framingham, Mass.

Please send me without obligation, booklet "If You Could Only Be at Every Point of Sale."

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lows: 1. Machine direction—the direction of the paper parallel to its forward movement on the paper machine. 2. Cross direction—the direction of the paper at right angles to the machine direction. To test, cut a circular specimen about two inches in diameter. To identify, first draw a straight line through the section and adjacent parts of the paper from which specimen is to be cut. Specimen is then floated on water and the direction of curl noted. The axis of the curl is parallel to the machine direction of the paper. This practice is recommended by the American Society for Testing Materials.

PENACTION FOUNTAIN BRUSH

Diagraph-Bradley Stencil Machine Corporation, 3745 Forest Park Blvd., St. Louis, Mo., has just placed on the market a new type of fountain stencil brush. This



Diagraph-Bradley's New Stencil Brush

brush has a fountain-pen action, with a continuous, controlled flow of ink—operates like a fountain pen—always ready for use. It will work with any stencil ink at the present time on the market. The brush is of aluminum, simplified construction and is very durable. It is designed with a large fender guard to prevent ink on the bristles from getting on clothing, tables, etc. when it is laid on its side. This fender is hexangular and therefore prevents the brush from rolling. Though light in weight brush is said to have unusually large ink capacity.

METAL SWIVEL IRONS OFFICE CHAIRS

The use of metal swivel irons in office chairs is subject to the provisions, established in Limitation Order L-260-a, governing the substitution of metal parts for wooden ones in the production of furniture, the War Production Board rules.

As explained in Interpretation 2 to L-260-a, issued today, manufacturers may substitute metal swivel irons for wooden ones in making office chairs under L-260-a only to the extent that they do not thereby increase their dollar value of furniture production in any quarter over that in the fourth quarter of 1944.

For example, if a furniture manufacturer's chairs with metal swivel irons have the same dollar value as his chairs with wooden ones, he may not use the wood that he saves per chair to make more chairs than he made in the last quarter of 1944, even though he would not exceed his wood quota under L-260-a.

All persons who put metal swivel irons into incomplete office chairs are regarded as manufacturers under L-269-a and are subject to the restrictions of the order.

This does not apply, however, to per-

(Continued on page 241)

Groton Plant





Where Good Impressions Count Most "Neidich Line" Typewriter Ribbons and Carbon Papers Win Instant Favor

Ever-increasing, the universal popularity of Neidich products is the direct result of over forty years of quality manufacturing standards. That's why Neidich customers come back, again and again. They know they can count on Neidich Typewriter ribbons and carbon papers for invariably legible, uniformly sharp, durable impressions. Call your local dealer, or write

Neidich Process

New York City

New York

St. Louis Missouri San Francisco California



Isn't it fortunate that BOSTON
Pencil Sharpeners were originally made with such sturdy quality
and such engineering precision that
they continue to serve today, long
beyond their expected span of usefulness. We appreciate your gracious cooperation with Government
regulations by getting along with
what you have until Victory.

A limited number of Boston KS sharpeners are now being manufactured. In accordance with priority regulations, we must fill all priority orders first, and in order of rating.



BOSTON PENCIL SHARPENERS

C. HOWARD HUNT PEN COMPANY

SPEEDBALL PENS

HUNT PENS

office metal ones, s niture. terpret pairers Regula assigne swivel

APRII

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sons who remodel completely finished office chairs merely by putting in new metal swivel irons in place of wooden ones, since they are not making new furniture. Furthermore, according to the interpretation, such persons are not "repairers" or "reconditioners" under CMP Regulation 9A and may not use a rating assigned under that regulation to obtain swivel irons.

SALVAGING OLD FORMS

Because paper is becoming such a critical material, certains forms which have become obsolete may be used to good advantage, if unwanted information can be blocked out and current information imprinted on Multigraph equipment. The Multigraph Type Department of Addressograph-Multigraph Corp., Cleveland, O., has designed a type blank which will fill the requorement. It is a pica blank (10 to the inch) and is type high. It is available only in DUROclear textype for typesetters and Set-O-Types, and may be ordered from local Multigraph representatives under No. 725 Type blank.

1 1 1 **NEW PLIATAB COLD** PADDING GLUE

New Pliatab Cold Padding Glue is announced by Paisley Products, Inc., Chicago and New York. It is packaged in quart and gallon clear glass jars. Pliatab is described as a liquid plastic padding glue, a product of research in synthetic resins to find a replacement for pre-war types of rubber latex padding compounds. Available in red or white (natural) colors, the use of clear glass containers enables quick identification of contents. Wide openings permit entrance of brush used in applying the glue to form a flexible, non-tacky film to the edges of office forms, tablets, scratch pads, etc.

MAKE FOAM RUBBER FROM SYNTHETIC LATEX

Development of a process to produce foam rubber from synthetic latex is announced by The Firestone Tire and Rubber Company.

The new synthetic product, as soft and fluffy as an angel food cake, also can be produced in medium and firm densities, and volume production of it already is under way in Firestone factories.

Whipped into a creamy froth much as a housewife beats egg whites for her cake, the synthetic latex traps innumerable interconnected tiny air bubbles, which give the foam rubber its softness and permit free circulation of cooling air.

The finished material compares so favorably with the natural foamed latex which Firestone made before the war that the same name-Foamex- has been given the new product. Foamex is extremely light; it is odorless, washable and sanitary, and unattractive to moths or vermin. The cost is low. The tensile strength of the synthetic

(Continued on page 242)



In these days of complicated business procedure, it is important to select the right paper for correspondence, reports and office records. Realizing this fact, office managers specify

EAGLE-A ACCEPTANCE BOND

the 50% Cotton Content grade that is an "odds on" favorite with Printers, Lithographers, Engravers and Stationers - men who know paper.

Eagle-A Acceptance Bond is available in Substance 13 and 16 in White, Ivory and six colors, and in Substance 11, White, for lightweight records, Air Mail and general office use.

The Eagle-A Acceptance Group also includes Eagle-A Acceptance Record-Ledger and Eagle-A Acceptance Index Bristol.

Eagle-A Boxed Typewriter Papers include Eagle-A Acceptance Bond

APRII

(Continued from page 241)

material is equal to or greater than that made with natural latex, and it can be made to remain flexible at temperatures ranging down to 40 degrees below zero.

The ability of Foamex made from synthetic latex to resist gasoline and oil, which destroy natural rubber products, will give it many important new applications. When soaked in gasoline, the synthetic material increases slightly in volume, but returns to normal when dry. Oil affects it little.

AIM TO PREVENT CUT IN PAPER QUOTAS

The War Production Board's Printing and Publishing Division hopes to prevent a cut in paper consumption quotas for the second quarter of 1945, in spite of a definite reduction in the supply and delivery of paper to the printing industry, J. Hale Steinman, director of the Division, told the Printing and Publishing Labor Advisory Committee at a recent meeting.

Continue Current Consumption

Mr. Steinman reported that a survey of newsprint, magazine and commercial paper inventories indicates that it may be possible to continue current consumption for the second quarter in the face of reduced deliveries from the mills. Industry representatives with the larger inventories have expressed a willingness to make this possible by putting a certain amount of their allowable tonnage at the disposal of WPB for the use, if necessary, of publishers with low inventories. The Printing and Publishing Division therefore anticipates a reduction in paper deliveries but possibly no cut in paper consumption quotas for the second quarter. The members of the Labor Advisory Committee unanimously approved this solution.

James Killen, Labor Assistant to the Paper Division, warned that, up to the present time, cuts in paper quotas have been proportionate for all paper consumers, but that hereafter it may be necessary to determine quotas according to the essentiality of the end-product.

NON-CURLING REMOISTENING GUM

A new non-curling remoistening gum for use on light weight air mail envelope stocks that facilities machine application, has been developed by National Adhesives, 270 Madison Ave., New York N. Y.

Envelope manufacturers working with this type of stock frequently experience difficulty due to the tendency of fast drying front seal gums to curl extremely light weight papers... complicating both the machine operation and the subsequent packing of the envelopes.

National's new formula is identified as Air Mail FS Gum and possesses an exextremely light color, a high gloss, clean machining characteristics and a responsive tack when remoistened. Its hygroscopicity is very low for a non-curling gum, so that the danger of blocking is minimized.



Are you making a good impression?

Are your executives' letters making the best impressions on your customers? MultiKopy Typewriter Ribbons are tailor-made for "front office" work. This extra-length ribbon, made of the sheerest fabric, gives results as smooth as silk. It's specially inked to give extra-clean, extra-sharp impressions. And prompt deliveries are assured.

Webster also makes carbon papers for gelatine hektograph and spirit process duplicating machines; carbon paper ribbons for photo-offset work; ribbons and carbons for all Elliott-Fisher Addressing, Adding and International Business Machines. F. S. Webster Company, 7 Amherst Street, Cambridge 42, Massachusetts.

WEBSTER'S

Micrometric Carbon Papers and Typewriter Ribbons

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TAKE it by and large, the No. 1 headache of modern business is wasted'time.

Messengers, clerks and executives traipse around correcting what could have been done right the first time by clear instructions, clearly transmitted.

Your business forms can be efficient. They can speed up the writing of handwritten records as much as 172%, of machine-written records, 95%. They can reduce confusion, overlapping, the cost of tedious routine. They can be custom-built to save you thousands of hours yearly!

The nine companies listed below have long been under Moore ownership. Now they combine under the Moore name-forming the largest company of its kind in the world. For the first time, a fund of experience so diverse as this is available on a nationwide scale. Moore goes every step of the way for you, from preliminary studies to actual printing in lots of hundreds or millions.

The Moore specialist who is ready to consult with you speaks the language of your own business. Let him demonstrate now how Moore business form engineering and printing can show results. Get in touch with the Headquarters of your nearest Moore division, as listed below, or its local office.

AMERICAN SALES BOOK CO., INC., NIAGARA FALLS; ELMIRA, N. Y. PACIFIC MANIFOLDING BOOK CO., INC., EMERYVILLE; LOS ANGELES, CALIF. GILMAN FANFOLD CORP., NIAGARA FALLS, N. Y. COSBY-WIRTH MANIFOLD BOOK CO., MINNEAPOLIS, MINN. MOORE RESEARCH & SERVICE CO., INC., NIAGARA FALLS, N. Y. SOUTHERN BUSINESS SYSTEMS, INC., ORLANDO, FLA.

-Moore Business Forms, Ltd., succeeding Burt Business Forms, Ltd., Toronto; Western Sales Book Co., Ltd., Winnipeg and Vancouver; National Sales Check Book Co., Ltd., Montroal

MOORE BUSINESS FORMS, INC.

PERSONALITIES in the NEWS

Fred W. Beerbohm, Purchasing Agent, Seymour Packing Co., Topeka, Kans., has been elected a director of the company.

William T. O'Conner was elected to the office of Vice President in charge of Purchases, for Manning, Maxwell &



William T. O'Connor

Moore, Inc. New York, at the recent annual meeting of the board of directors. He has been with the company in purchasing work since 1928, when his former company became a part of the MM&M organization, and was appointed General Purchasing Agent in 1932. The company operates plants in Bridgeport, Conn., Boston, Mass., Muskegon, Mich., Tulsa, Okla., and Jersey City, N. J. Mr. O'Conner became a member of the Purchasing Agents Association of New York in 1922 and has been active in its affairs, serving two terms on its executive committee.

Thomos H. Kepner, formerly staff supervisor, manufacturing and repair department, Westinghouse Electric & Manufac-



Thomas H. Kepner

turing Co., Pittsburgh, Pa., has been transferred to the Emeryville, California, plant as production and procurement supervisor.

Charles H. Brown, until recently a member of the Purchasing Department of the Lukens Steel Co., Coatesville, Pa., has retired after 49 years of service.

Frederick T. Huber has been named General Purchasing Agent of the V. Lofstrand Company, Silver Springs, Maryland Prior to the war, this company manufactured electric washing machines for glassware. It is now producing war products and has been awarded a star for its Army-Navy "E" pennant. Mr. Huber formerly was Assistant Purchasing Agent of the Engineering & Research Corporation, Riverdale, Md., and a member of the Purchasing Agents Association of Washington, D. C.

Mojor M. Poole, Director of Purchases of E. C. Atkins & Co., Indianapolis, Ind., recently completed his 45th year of continuous employment with the company. He was presented with a diamond studded Merit Award and an Award Certificate in appreciation of not only his long service but for the part he has played in the progress of the company through his expert knowledge of its products and his sound judgment and counsel in manufacturing methods.



Major M. Poole

Mr. Poole's experience dates back to a boy putting wooden plugs in crosscut handles, which in recent years have been replaced by malleable iron nuts, on through various departments of the factory into the cost department, thence to to the Purchasing Department. In 1920 he became Purchasing Agent of steel and other commodities used in the manufacture of saws and tools and also office supplies. In 1940 he was elected to the Board of Directors and became Director of Purchases covering all purchases of the Indianapolis plant and its branches. He supervises the purchase of all materials used in the manufacture of armor plate and other war materials.

Gilbert D. Dill, formerly Purchasing engineer for Arthur G. McKee & Company, Cleveland, in charge of purchases involved in the construction of wartime steel plants, has been made sales engineer, American Foundry Equipment Co., Mishawaka, Ind.

Ellis E. Doherty has been appointed Director of Purchasing and expediting, at the Manchester, N. H., plant, Marion Electrical Instrument Company.

E. Joseph Bobkes has been appointed Radio Purchasing Agent for Lear, Incorporated, Grand Rapids, Mich. Mr.



E. Joseph Babkes

Babkes, who formerly was in charge of scheduling distribution of radio test equipment for the War Production Board, is a graduate of Polytechnic Institute, Brooklyn, N. Y. He served with the WPB in Washington for three years, dealing with more than 700 suppliers throughout the country. His office handled both raw materials and processed parts for radio equipment for all branches of the armed forces. Prior to being called to Washington he was a radio engineer with the Army Signal Corps at Fort Monmouth, New Jersey.

F. T. Fendley has been named Purchasing Agent for the Humble Oil & Refining Co., Houston, Texas, succeeding



F. T. Fendley

Frank Watts, purchasing agent for the past seven years, who has been named sales manager. Mr. Fendley formerly was assistant purchasing agent. He has been with the Humble company for 25 years and has been connected with the purchasing department since 1933. He is a past president of the Purchasing Agents Association of Houston.

(Continued on page 246)



LITERALLY hundreds of valve users—engineers, superintendents, maintenance men, purchasing agents—have exclaimed on seeing it, "Where has this valve been all my life?"

For this "X-Ray" shows you the inside story of the Darling Valve—the unique gate valve with the fully revolving double discs and parallel seats. It shows why Darling's unique design permits the gate to adapt itself to out-of-line positions of the valve seats; caused by line strains,

high temperatures and pressures which distort the body of any valve.

Seeing this demonstration, you quickly visualize just why the Darling Valve gives you (1) tighter closing, (2) easier operation, and (3) longer life.

So let the Darling man X-Ray Valve Values for you when he calls. To bring him immediately, if you've a valve problem right now, just drop us a line, or wire, or phone us.

DARLING VALVE& MANUFACTURING CO.

WILLIAMSPORT, PA.

Darling Valve & Mfg. Co., Dept. H, Williamsport, Pa. Gentlemen: I want to know more about Darling valves. Please send your Catalog.

varves. Frease send your Catalog

Company.....

City..... State....



Constructed in accordance with Underwriters Laboratory Specifications. Approved by Associated Factory Mutual Fire Insurance Companies.

Reinforced top extra strength to stand up under rough treatment. Gravity closing for safety-can't stay open.

Opening mechanism hugs can exterior-no place for clothing to catch.

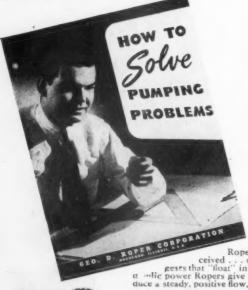
Man-size handles -- securely riveted, make moving and handling much easier.

Full apron body amply ventilated for air circulation. Firm foundation eliminates tipping. Constructed of galvanized steel.



ROCHESTER CAN COMPANY 80 GREENLEAF STREET ROCHESTER 9, N.Y.

NEW FREE ROPER BOOKLET



PACKED, from cover to cover, with information valuable to pump users. 32 pages of tables, charts, detail drawings, data on various liquids and how to pump them, how to select the proper size and type of pump, how to compute suction lift, how to estimate horsepower and many other helpful facts.

Roper pumps have the simplest design ever conceived ... only 2 moving parts ... equal size pumping gents that "float" in operation. For transfer, lubrication, or hydropower Ropers give dependable, economical service. They produce a steady, positive flow, absolutely free from pulsation.

GEO. D. ROPER CORPORATION, ROCKFORD, ILLINOIS



Send for Bulletin No. 4-37



(Continued from page 244)

Glenn N. Hackett has been named Direc. tor of Purchases for Thompson Products, Inc., Cleveland, Ohio, succeeding H. D. Myers, resigned. He started with the former Thompson Aircraft Products Co. six years ago in the Purchasing Department as a follow-up clerk, later being made buyer and then Purchasing Agent and assistant to Mr. Myers. Thompson Products, whose main plant is in Cleveland, also has plants at Detroit, Mich., at St. Catherine, Can., and on the West Coast. Mr. Hackett has 106 employees under his supervision, approximately 90 of whom are in Cleveland.

J. L. McManus has been named secretary of Skilsaw, Inc., Chicago, Ill. He formerly was Director of Purchases, Mr.



McManus, who is a member of the company's Operating Committee, is a patent and corporation attorney, and has been Skilsaw's contact with governmental bureaus in Washington.

M. Lindroth, Production Manager and Purchasing Agent, General Machine Co., Inc., Emmaus, Pa., has been elected vice president of the company. He was first employed by the company in 1926 as receiving clerk in the manufacturing department later being transferred to the general office and assigned to administrative and statistical work. In January 1931 he returned to the factory as assistant to the general superintendent, and in January 1933, he was appointed Purchasing Agent. When the company moved from New York to Emmaus in April 1941, Mr. Lindroth took on the added duties of Production manager. As vice president he will continue in charge of Purchasing and production.

Seymour T. Hull has been made Purchasing Agent, Manhattan Soap Co., New York, N. Y. He formerly was manager of the purchases and materials division of the Los Angeles plant of the U. S. Rubber Company.

(Continued on page 250)

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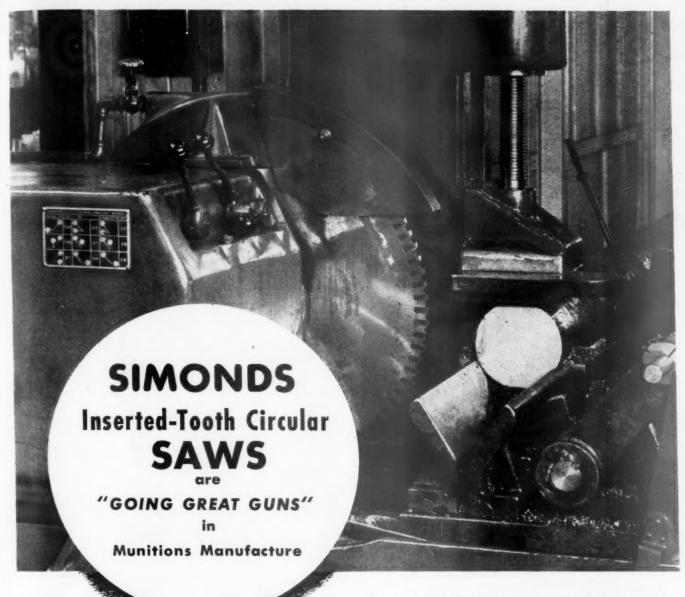
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Today's Simonds Inserted-Tooth "Red Streak" is the most advanced development in metal-cutting saws. This Simonds design features curved gullets and high-speed steel teeth... with a wedge for every tooth... to provide greater cutting speed, feed, and depth of cut. Production is nearly double that of solid-tooth saws. And the teeth can be sharpened in the plate, or replaced when needed by a mechanic right in your own plant. Chips can't weld on. High temperatures can't dull the cutting edge.

That's why plants throughout war industry are regularly getting top saw-performance like, for instance, cutting 7-inch billets of cartridge brass in seven seconds each. You can get it, too, with Simonds "Red Streak" Inserted-Tooth Saws.

BRANCH OFFICES: 1350 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 228 First St., San Francisco 5, Calif.; 311 S. W. First Ave., Portland 4, Ore.; 31 W. Trent Ave., Spokane 8, Wash.

PRODUCTION TOOLS

FOR CUTTING METAL,

WOOD,

PAPER, PLASTICS



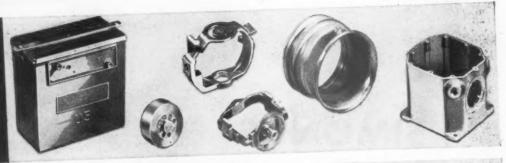
CUT THE WAR SHORT ... BUY WAR BONDS ... AND THEN BUY MORE WAR BONDS

APRIL

3 Way

Die Castings

Manufacturing facilities are modern and exceptionally complete. They include trimming, precision machining, plating, painting, cronaking and anodizing.



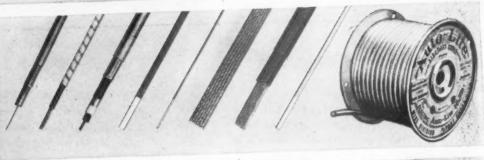
Plastics

All-plastic products, metals and plastic-metal combinations with various types of ornamentation are produced entirely under one roof at the Bay Division.



Wire and Cable

Wire and cable is available in a full range of sizes, shapes, materials and insulations including heat-resisting Vega Chromoxide enamel and other special types.



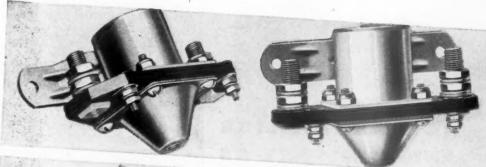
Instruments

A wide range of pressure gauges, tachometers, thermometers and speedometers, etc., is available from Auto-Lite for industrial, aviation and automotive use.



AUTO-LITE

AUTO-LITE can serve you



Aircraft Relays

Auto-Lite relays and switches are made for intermittent or continuous duty. In developing them, Auto-Lite combines the features of long life and low price.







Batteries

Auto-Lite batteries are built in every type and size to fit various models of passenger cars, trucks, buses, stationary engines as well as aircraft.







Spark Plugs

Auto-Lite spark plugs are designed for use in automobiles, trucks, buses and aircraft and are engineered to work in harmony with the complete ignition system.



Tune in "Everything for the Boys" Starring Dick Haymes—Every Tuesday Night—NBC Network

Electrical Parts

For thirty-three years Auto-Lite has been producing precision-built starters, generators, distributors and coils which are specified by many leading manufacturers.

The products shown here are applicable to many industries. Address your inquiries about any of them to: THE ELECTRIC AUTO-LITE COMPANY, Toledo 1, Ohio . . . New Center Bldg., Detroit 2, Michigan—Tower Petroleum Bldg., Dallas 1, Texas—Chrysler Bldg., New York 17, N. Y.—1016-17 Halliburton Bldg., Los Angeles 14, Calif.—600 S. Michigan Ave., Chicago 5, Illinois—12 Richmond St., E., Toronto 1, Ontario—Canada.





It's the exceptional industrial plant that fails to provide salt tablets for its employees. Only a few years ago it was otherwise. Salt Tablets have become an industrial "must" for men who work — and sweat.

Sweat robs the body of vital salt. This throws the body fluids out of balance. The result is Heat-Fag, inalertness, accidents, heat prostrations. The preventive is salt and water — water to restore the moisture lost in sweat, salt to restore the saline balance. Water alone won't do it. Both are needed.

The easy, simple, sanitary way to provide salt to workers who sweat is Morton's Salt Tablets available at every drinking fountain. The cost is less than a cent a man per week.

In salt tablets, as with other grades and types of salt, Morton is the recognized leader. Order Morton's Salt Tablets and Dispensers from your distributor or directly from this advertisement. Write for free folder. Morton Salt Company, 310 S. Michigan Avenue, Chicago 4, Illinois,

MORTON'S DISPENSERS

They deliver salt tablets, one at a time, quickly, cleanly—no waste. Sanitary, easily filled, durable.

800 Tablet size - - \$3.25

MORTON'S SALT TABLETS

Morton's Salt Tablets are available either plain or with dextrose.

Case of 9,000, 10-grain salt tablets - - - - \$2.60

Salt Dextrose Tablets, case of 9,000 - - - - \$3.15

MORTON'S SALT TABLETS

(Continued from page 246)

Mox Fowler succeeds W. E. Koenig, resigned, as Purchasing Agent for the Moore-McCormack Lines, Seattle, Wash.

C. W. Anderson has been named Purchasing Agent for Crescent Manufacturing Co., Seattle, Wash., succeeding E. S. Carico, resigned.

John S. Seltzer, former manager of Purchases and stores for Westinghouse Electric & Mfg. Co., at Cleveland, is now associated with the Coils Engineering & Manufacturing Co., Roanoke, Ind., in an executive capacity including purchasing.

Loring H. Roymond has been named Manager of Purchases, Lighting Division. Westinghouse Electric & Manufacturing Co., Cleveland, Ohio.

L. R. Merritt succeeds William Webster as Purchasing Agent of the Clark Manufacturing Co., Cleveland, Ohio. Mr. Webster has been named assistant treasurer of the company.

Leslie P. Broberg, Purchasing Agent, city of Salt Lake City, Utah, has been elected president of the Salt Lake City Employee's Association credit union.

Horry S. Konetzky has been appointed Purchasing Agent of St. Louis County. St. Louis, Mo.

George W. Eddy, formerly city Purchasing Agent, Houston, Texas, has been appointed first assistant city attorney.

Rolph L. Streever has been named Purchasing Agent of the Mariaville, N. Y., Board of Education.

Gavin Alexander, Jr., has been made Purchasing Agent of the Allentown Division of Consolidated Vultee Aircraft Corporation.

Frank Pokswin, formerly buyer in the state purchasing department Washington. has been made Supervisor of Purchases.

Tom Wood has been made Purchasing Agent for the Fisher Flouring Mills, Seattle, Wash. He formerly was store-keeper for the company.

Eurl C. White, Editor of Washington Purchasing Agent and Manufacturer, was elected president of the Seattle Area Council of the Boy Scouts of America.

Lee A. Boumhover, formerly purchasing agent for the city of Portland, Ore., is now connected with the Northwest Marine Iron Works in Portland, as buyer.

Joy Gage has been named Purchasing Agent for the Northwest Ship Repair Co., Seattle, Wash. He formerly was purchasing agent for the Winslow Marine Railway.

George W. Turner has joined the F. G. Foster Co., Hoquiam, Wash., in charge (Continued on page 252)

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HEAT PROVER .. QUICKLY REVEALS INCOMPLETE COMBUSTION

FREE Demonstration Test Will Help Solve Your Combustion Problems . . . Conserve Fuel . . . Increase Quantity and Quality of Your Product.

Today, like many engineers in both small and large industrial plants, you very likely want to know—by accurate measurement—the answers to these four vital problems:

- 1. Just how efficiently do my boilers burn fuel?
- 2. How efficiently do wartime operators control them?
- 3. What have wartime overload conditions done to normal fuel economy?
- 4. And what, actually, is the status of my combustion control equipment?

To all these questions—and more—Cities Service has the almost perfect answer in the Cities Service INDUSTRIAL HEAT PROVER. This unique instrument quickly analyzes combustion... accurately determines degree of fuel waste due to air deficiency or dilution. Thoroughly tested on practically every type of combustion equipment in this country and with every kind of fuel, the Industrial Heat Prover already has been adopted by users of steam power plants, open hearth furnaces, cement kilns, heat-treating apparatus, crucible furnaces and internal combustion engines. And for a very good reason.

Accurate combustion analyses made as a result of the Cities Service Industrial Heat Prover tests have effected considerable avings in fuel costs...reduced repairs and replacements on furnace linings, crucibles and refractories due to flame corrosion... and have led to increased production of better and more uniform products.

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Why not get a Cities Service Industrial Heat Prover Test in your own plant? You may have it without cost or obligation—if you will simply mail the coupon at right. A Cities Service Engineer will then make an Industrial Heat Prover Test in your plant—at your convenience. Mail the coupon—today.



(Titis offer is available only in Cities Service marketing areas EAST of the Rockies.)

greater combustion efficiency at less cost.



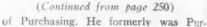
Cities Service Oil Company

Sixty Wall Tower, New York 5, N. Y.

Gentlemen: Please arrange a Cities Service Industrial Heat Prover Test for my plant. I understand there is no charge or obligation for this service.

Cities Service Research Division enables those engaged in the oxygen control of furnace atmospheres to achieve

APRIL,



of Purchasing. He formerly was Purchasing Agent for the Grays Harbor Shipbuilding Company.

Rolph Etchey, Purchasing Agent, Seattle Hardware Company, was recently elected vice president in charge of Purchases.

Carl Reynell, Purchasing Agent of Worthington Pump Co., has been elected president of the New Jersey Group of the Cornell Society of Engineers. As group president he is also vice president and a member of the Board of trustees of the national body.

Maj. A. C. Gray of Columbus, Ohio, has been appointed Purchasing Agent for the State Highway Department. He was recently with the Ninth Air Forces overseas, having been discharged because of injuries received in an auto crash in France.

Stuart A. Loveridge has been named Purchasing Agent of the Autotyre Co., Oakville, Conn., and Homer R. Bernier was made Assistant Purchasing Agent. Mr. Loveridge was formerly field sales manager.

George F. Speechly, County Purchasing Agent, Albuquerque, N. M., has also been named county manager.

G. C. Hurrington has been appointed Special Project Coordinator and Expeditor, Transcontinental & Western Air, Inc., Kansas City, Mo.

Gordon Wood has been made Assistant General Purchasing Agent for United Air Lines at its central maintenance base at Cheyenne, Wyo.

AMONG THE COMPANIES YOU BUY FROM

Titonium Alloy Monufacturing Company, Niagara Falls, N. Y. Karl B. Thews has been appointed manager of sales. Jack G. Merriam has been named sales representative in the Detroit area with head-quarters in Toledo. Harold D. Prior has been transferred to the New York sales staff, and has been placed in charge of the work. John R. Lewis has been assigned to the Pittsburgh territory sales department.

General Electric Company, New York district. G. H. Reid has been appointed assistant district manager. H. M. Sliter has been named district manager of the Central Station division, and R. M. Darrin as assistant district manager. Horace Zimmer has been made district manager of the Industrial Division, and H. M. Bardin has been appointed manager of sales of the Federal and Marine section. R. B. Ransom has been appointed manager of the New Haven office, and J. Pascher will manage the Hartford office.

(Continued on page 256)



AMERICA'S STANDARD FOR OVER 20 YEARS



use the self-contained, semi-automatic

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Dies set to pipe size in 10 seconds.

 It's ready in a jiffy to cut perfect threads on 1", 11/4", 11/2" or 2" pipe - 1 set of dies does it, and they stay in the threader, can't get lost. You set the 65R to pipe size in 10 seconds. You set the mistake-proof workholder instantly without bushings. You cut threads rapidly, without effort. You save time and work with this rugged steel-and-malleable precision tool-it's one you'll enjoy owning and using. Demand is ahead of supply just now - but keep asking your Supply House.

More Service... Less Upkeep UNCONDITIONAL GUARANTEE If this Housing ever Breaks or Distorts we will replace it Free THE RIDGE TOOL CO. when you use the Guaranteed RIBAID **Heavy-Duty Pipe Wrench**

 It looks different – but the real difference is in its performance. The housing simply won't break or warp - no bother or expense of repairs. Fullfloating hookjaw (with handy pipe scale) and replaceable heeljaw take hold instantly, won't lock on pipe. Adjusting nut in open housing spins to pipe size. Powerful comfort-grip I-beam handle eases hard pulls. Ask your Supply House for the rugged work-saver RIDGID. We're manufacturing more of them than ever, but

it's not enough. please be patient.



Millions of RIBOID Tools in use

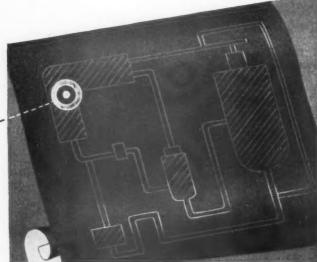


WORK-SAVER PIPE TOOLS

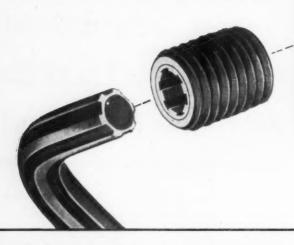
The Ridge Tool Company Elyria, Ohio, U.S.A.

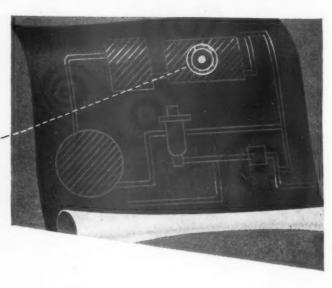
When you must choose between





and TIGHTER





Only BRISTOL gives you both

For many socket set and cap screw applications, the Bristol Hex Socket Screws give you the strength you're after—more convenience and greater strength than with conventional hex screws.

Bristol has made socket screws for 32 years, and its manufacturing methods have been developed along precision lines.

Size of socket, fit of thread, fit of wrench in socket ...meet precision tolerances, because Bristol works to much closer tolerances. Bristol's other socket screw

—the "Multiple-Spline"—has to be made to extremely close tolerances—you get this bonus in the hex.

ha

Strength is greater — particularly right under the head of cap screws — because Bristol's unique method of cold-upsetting and extruding high-grade alloy steel develops the proper elasticity plus surface hardness. Threads are also extruded for greater accuracy of lead and pitch (giving a Class III fit) and increased surface hardening. Cap screws are knurled for convenience in handling.

Bristol Hex Socket Screws are made in all sizes down to and including No. 4 wire. On the smaller sizes, Bristol often recommends its "Multiple-Spline".

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ONLY BRISTOL has improved the Socket Design

For the smaller sizes, where there is danger of the socket wall breaking under wrench pressure . . . for applications where vibration will be encountered, requiring extra holding power in the fastener . . . for cases where the screw will be frequently removed and returned . . . Bristol alone can recommend a socket set or cap screw that's geared to the wrench.

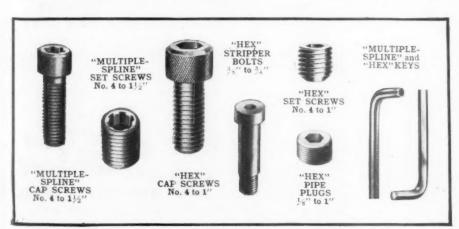
The exclusive design of the *Bristo* "Multiple-Spline" Socket speeds up assembly and provides a tighter fastening. Geared transmission of rotary turning power simplifies effort and prevents slippage. It can be turned far beyond the point where a hex would burst or at least round out — because the key *pulls* the screw around, without expanding pressure. Yet, for adjustments, a flick of the key will loosen it.

The *Bristo* "Multiple-Spline" Socket Screw is specified by leading aircraft and communications equipment manufacturers; is ideal for electrical appliances, cameras, motor assemblies, instruments, etc. The Bristol Company, Mill Supply Division, 132 Bristol Road, Waterbury 91, Connecticut.





has the right socket screw for every application



AT LAST a belt hook THAT'S FAST AND TRUE!



Now Bristol announces an improved method of fastening joints in transmission belts. It's a hinge-type wire fastener that can't go wrong.

A unique method of attaching the hooks to the spacer card saves time and insures a strong fastening which distributes pull evenly.

Ask your distributor for Bristol's "B LINE" TRANSMISSION BELT HOOKS. They will speed up the work and strengthen the joint.



See how the individual hooks are supported — each one passes through the spacer card at 6 points! When you cut off, the hooks stay in alignment — they can't flop around. No stiffener to slit, either, because the open end is protected by a V-shaped card that slips right out. You save steps — you save trouble.



Transmission Belt Hooks
FAST and TRUE

Also CONVEYOR BELT LACING

Staggered Points





Plates and Rivets



FOR speed and economy in cutting metals, be sure always to select the type of blade that is absolutely right for the material you are handling and the cutting job you have to do. That right blade — whether for sawing lightest sheets or hardest alloy bars, by power or by hand — is always to be had in the Griffin line . . . Every blade uniformly dependable, backed by the progressive experience of one of America's very oldest manufacturers of hack saws.

GRIFFIN HIGH SPEED STEEL — Cuts toughest alloys — stainless, chrome, nickel, etc. Specially hardened tungsten steel, in power and hand sizes.

GRIFFIN MOLYBDENUM HIGH SPEED
— For highly economical production cutting of all but very hardest alloys. Power and hand sizes.

GRIFFIN SOFT CENTER — An exclusive Griffin development for hand sawing. Center soft but TOUGH for utmost flexibility; teeth and back hard-tempered for endurance. Most economical general-purpose blade.

GRIFFIN NON-STRIP—For cutting thin sheet metal, tubing, etc. Special temper protects teeth from breakage.

Write for FREE descriptive folder

General Sales gent
JOHN H. GRAHAN & CO., Inc.
105 Duane Street, Nev ork 8, M.Y.

GRIFFINA

Hack Saw Blades

MADE BY G. W. GRIFFIN CO., FRANKLIN, N. H. - 1880-1945

(Continued from page 252)

Pittsburgh Plote Gloss Compony, Atlanta and Pittsburgh offices. R. W. Mothershed has been appointed manager of the Atlanta branch, and Felix T. Hughes has been transferred from that post to Pittsburgh as assistant manager of the plate glass sales department.

Minnesota Mining and Manufacturing Company, St. Paul office. Bert S. Cross,



formerly new products manager, has been promoted to the position of general manager of the "Scotchlite" division, Scotchlite is reflective material composed of glass spheres coated 5,000 to the square inch on a synthetic resin film, which at night sends back light in glareless reflection.

A. O. Smith Corporation, Eastern district, Whitehead Metal Products has been appointed eastern distributors for Smithway welding electrodes.

Macwhyte Company, Kenosha, Wis. R. P. Tyler has been made general sales man-



ager. He formerly was sales manager for A. Leschen & Sons Rope Co., and previously was with John A. Roebling's Sons Co. H. E. Sawyer, formerly general sales manager, and vice president and treasurer, will continue as vice president and comptroller.

American Chain & Cable Company, New York office. William Wagner has been appointed New York district sales manager for the Reading-Pratt & Cady Division with headquarters at 230 Park Avenue. Mr. Wagner succeeds E. Coit Magens, who has become manager of the Valve Division of the company's Export Department.

Faraday Electric Corporation, Chicago.
The executive, sales and advertising
(Continued on page 258)

SAFETY

(Reg. Trade Mark)

WEDGE GRIP LETTERS & FIGURES

- · No Spalling!
- No Mushrooming



Pat. No. 2,089,794

- For tough stamping jobs.
- Deeper impression with less exertion
- Any size character from 1/16" to 1"
- 25% to 50% more service

WRITE FOR LITERATURE
HELP PREVENT AN ACCIDENT TODAY.





TO CUT THOSE 29,700,000 LOST MAN DAYS*

Lost because of injuries to head and eyes in 1943. Supply workers with equipment they will wear—designed for comfort and protection. Investigate Sellstrom safeguards now. At your jobber or write.

*Statistics from OWI and Nat'l Safety Council.



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• At the Plastics Divisions of the General Electric Company there are full facilities for every type of molding job—fine modern equipment for fast economical mass production molding. Special machines cut complicated mold shapes with swift accuracy, preform compounds, unload wedges, ease or eliminate a hundred other operations in the manufacturing cycle.

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But it takes **more** than equipment to do quality, precision molding. The finest machine ever built cannot think. Imagination and experience—two prime factors in every new plastics application—are of even greater importance. Highly skilled chemists, designers, engineers, tool makers, and press operators are essential in making the fullest effective use of those machines in the manufacture of your product.

At One Plastics Avenue you will find the tools—and the men who know how to use them to contribute to the success of your next application. From the moment your product first takes form on the drawing board of the designer or engineer until it reaches you as a fine finished part, the quality of its design, and its economy in production are assured. It's made by men who KNOW plastics. Write Section B-4, General Electric Company, 1 Plastics Avenue, Pittsfield, Mass.

Hear the General Electric radio programs: "The G-E All-Girl Orchestra" Sunday 10 P.M. EWT, NBC. "The World Today" news every weekday 6:45 P.M. EWT, CBS. "G-E House Party" every weekday 4:00 P.M. EWT, CBS.



APRIL, 19

AW

HOLO-KROME

TRADE FIBRO FORGED MARK

SOCKET SCREWS



THE BETTER FASTENING METHOD



YOU CAN SAVE WEIGHT, SPACE and ASSEMBLY TIME

It's the Internal Wrenching feature! Save material (weight) due to the reduced area needed for fastening members . . . more compact design (space) . . . stepped-up production (assembly time) because of the quick and positive tightening . . . Adopt this better fastening method to your production — specify "HOLO-KROME".

THE CONTRACT OF STREET AND THE STREET AND THE STREET



GUARANTEED UNFAILING PERFORMANCE

THE HOLO-KROME SCREW CORP. HARTFORD 10, CONN. U.S. A

(Continued from page 256)

offices have been moved from the plant at Adrian, Michigan to 11 South LaSalle Street, Chicago 3, Ill. Midwest district office under the managerment of C. W. Morean and the branch office, managed by C. L. Hobbs will also be maintained at the same address.

Westinghouse Electric and Manufacturing Company, Pittsburgh, Pa. Leonard C.



L. C. Blevins

H. L. Buchner

Blevins has been named sales manager of the Meter Division, and H. L. Buchner has been assigned to succeed Mr. Blevins as Watthour Meter sales manager.

Arnold Hoffman Company, New York office. B. F. Sheehan, Jr. has joined the sales force as a representative, with head-quarters in the Empire State Building.

Rochester Can Company, Rochester, N. Y., Howard de Franceaux, formerly a manufacturers' representative and federal consultant in Washington, D. C. has been appointed sales manager.

Owens-Corning Fiberglas Corporation, Toledo, Ohio. Ben S. Wright has been



transferred to Cleveland as manager of the branch office at 825 Hanna Building. Mr. Wright succeeds W. H. Atkinson who has become manager of the Chicago branch office, 3206 Pure Oil Building. Frank L. Myers, former Chicago branch manager, has returned to the company's general offices to join the general sales organization, specializing in thermal insulation.

Youngstown Sheet and Tube Company, St. Louis and New York offices. E. E. Ellwood has been named assistant district sales manager of the St. Louis district, with offices located at 611 Shell Building. J. P. Feagley has been appointed assistant district sales manager of the New York district, with offices at 500 Fifth Avenue.

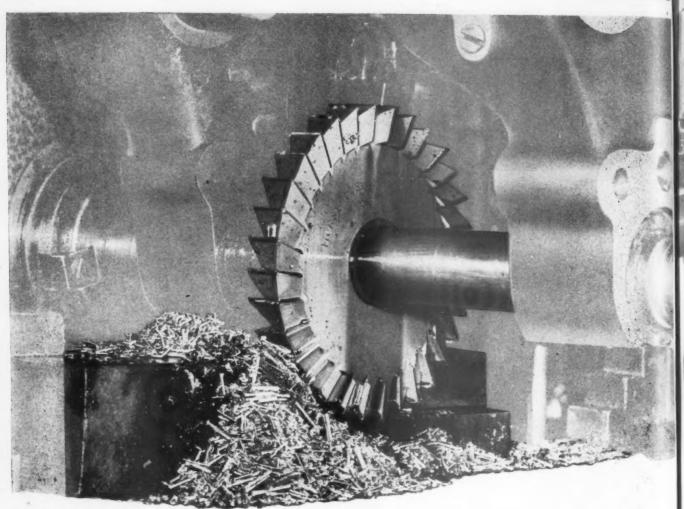
(Continued on page 262)

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Onter Brothers COMPANY BRANCH STORES: Wrentham, Massachusetts, U.S.A. SAN FRANCISCO CALIFORNIA CHICAGO ILLINOIS DETROIT, MICHIGAN



WHEN THE CHIPS ARE DOWN -

—you see why Morse tools are such dependable cost-reducers

When the chips are down... that's when you get proof that the teeth of Morse Cutters have proper clearance and are accurately ground. That's also when you begin to see what Morse precision manufacturing adds up to: less spoilage, less down-time for expensive machine tools, lowered costs. Use Morse Tools yourself!





TWIST DRILL AND MACHINE COMPANY

NEW BEDFORD, MASS., U.S.A.

NEW YORK STORE: 130 LAFAYETTE ST. - - - CHICAGO STORE: 570 WEST RANDOLPH ST.

SAN FRANCISCO STORE: 1180 FOLSOM ST.

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Page 8

District



LADSH Controlled Quality

For pipe lines, power plants, refineries and ships—where dependability is essential to pressure piping efficiency—Ladish Forged Steel Fittings reduce maintenance expense and safeguard against costly breakdowns.

Produced under exacting metallurgical controls and rigid standards of craftsmanship, Ladish Fittings bear the authentic symbol of Controlled Quality identification—the Ladish Heat Code.



ST





MILWAUKEE SUBURB

District Offices: Lincoln Bldg., New York City . Rockefeller Bldg., Cleveland . Peoples Gas Bldg., Pittshurgh . Sterling Bldg., Houston . Petroleum Bldg., Los Angeles



39 OAKITE OASES!

Despite the exigencies of wartime service, the precarious conditions of delivering needed goods, the delivery performance of the nationwide Oakite organization has been consistently good—thanks to the setup of the 39 strategically spotted Oakite warehouses across this busy Nation!

These centrally-located Oakite "oases" serve thousands of concerns. They rely upon Oakite as a dependable supply source for specially designed, war-tested Oakite materials for production cleaning, equipment maintenance and sanitation. Deliveries today are as prompt as may be expected from the available facilities of the overloaded carriers.

You stand to benefit by this operating fundamental of the Oakite organization: to see that you get the correct material in your plant on time—when you need it most!



There are over 70 specially-designed Oakite materials available for production, sanitation and maintenance cleaning. You have a wide choice of correct materials to do the job with top-performance results at the lowest possible cost.

Oakite's Entire Technical Resources Are Yours...

When you call in your nearest Oakite Technical Service Representative for consultation, he brings not only his broad, in-plant experience with production cleaning and surface preparation of Army and Navy materiel, but places at your disposal the entire technical resources of our Chemical Research and Mechanical Engineering Laboratories. Call him today—or write us direct—giving full details of your cleaning problems.

OAKITE PRODUCTS, INC. 54 Thames St., New York 6, N. Y.

Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE Buy Bondo CLEANING REQUIREMENT

(Continued from page 258)

Foote Bros. Gear and Machine Corporation, Chicago office. R. B. Moir has been elected assistant vice-president in charge of sales engineering of the Industrial Gear Division.

American Chain & Cable Company, New York office. Ralph J. Teeple has been appointed general district sales manager, with headquarters at 230 Park Avenue.

Lincoln Electric Company, Cleveland office. W. R. Persons has been promoted to



the position of assistant sales manager. He is also chairman of the firm's Junior Board of Directors.

Allis-Chalmers Manufacturing Company, Seattle and San Francisco offices. U. E. Sandelin has been named manager of the company's Seattle, Washington district office. Mr. Sandelin, who will also supervise the Spokane office, succeeds A. J. Schmitz, who has been made Pacific regional manager with headquarters at San Francisco.

Parker-Kalon Corporation, New York. S. S. Kahn, formerly assistant sales man-



ager has been appointed sales and advertising manager to succeed the late Charles S. Trott.

National Electric Welding Machines Company, Detroit office. Arthur B. Sonneborn has been appointed district manager in charge of its Michigan-Ohio sales, at 631 Fisher Building.

Rustless Iron and Steel Corporation, Baltimore. J. Raymond Smith has been assigned to the newly created position of assistant general sales manager.

American Chain & Cable Company, New York office. J. J. Walsh has been named district sales manager of the Page Steel and Wire Division, at 230 Park Avenue.

(Continued on page 264)

ADE E

CLEVELAND Quality HIGH CARBON CAP SCREWS



are made of C-1038 steel, heat treated to give you greater strength plus the additional toughness secured by Cleveland's method of manufacture—the famous Kaufman Process, originated in our plant. The rich black satin-like finish has rust-resisting qualities. Here is a dependable fastener of maximum strength and good appearance.



CLEVELAND
Top Quality
FASTENERS

at

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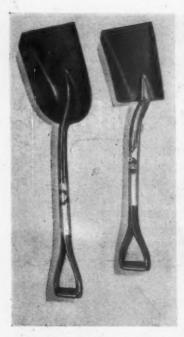
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teel nue. The Cleveland Cafe Screw Company
2933 EAST 79TH STREET CLEVELAND 4, OHIO
Warehouses: Chicago, Philadelphia, New York, Los Angeles

Ask your Jobber for Cleveland Fasteners

ADE BY THE ORIGINATORS OF THE KAUFMAN PROCESS FOR GREATER STRENGTH AND ACCURACY



All Blade Finishes now except Molders' Shovels and Grain which may be furnished with Polished Face and Brushed Back

344 DELAWARE AVENUE

These **Blade Edges**

We guarantee this if you make sure to specify . . .

The special Tillage Steel, known as TEM-CROSS, used in the manufacture of all Ingersoll Shovels, was developed in our own steel mills. By cross-rolling and special heattreating, we give this steel an interlocking, mesh-grain structure that resists splitting.

Distributors: Apply on Form WPB-547 with the Hardware and Small Tools Section of the War Production Board, Washington, D.C., for the necessary Priority Ratings.

INGERSOLL STEEL & DISC DIVISION

Borg-Warner Corporation NEW CASTLE, INDIANA

Plants: New Castle, Ind.; Chicago, III.; Kalamazoo, Mich.

ROUGH GRINDING



...it's not Cost of Wheel that counts.

but cost per ton of metal ground! Electro wheels plus Electro methods result in lowest cost per ton of metal ground.

> Let us send an engineer-sales-representative to show you how this works out with Electro Grinding Wheels. Write, wire or phone us at WAshington 5259.

REFRACTORIES & ALLOYS CORPORATION BUFFALO 2 NEW YORK

Established 1919

(Continued from page 262)

Shellmor Products Company, Pasadena and Chicago offices. F. P. Winslow, formerly in charge of the Eastern Sales, has become general manager responsible for manufacturing and sales in eleven western states. O. D. Carlson will continue as West coast sales manager. Gauss, sales manager of the Central division with headquarters in Chicago, will handle sales of the Eastern division in addition to his present activities.

Continental Can Company, New York office. G. E. DuCharme, formerly man-



ager of the New York district, has been named manager of paint and chemical containers sales, with headquarters in New York.

Merkin Paint Company, New York. William H. Suthpin has been appointed sales manager of the Marine Division, to succeed the late James A. Dravo. The office is located at 1441 Broadway.

Tyson Bearing Corporation, Massillon,



Ohio. Harry L. Vines has been named director of sales.

Paisley Products, Inc., Buffalo office. A R. Nordone has been appointed Western New York sales representative, with offices at 423 Eggert Road.

Rustless Iron and Steel Corporation, Southern Connecticut area. John H. Penfield has been made field service engineer and will be attached to the New York office located at 1840 Equitable Building.

Edw. S. Christiansen Company, Chicago office. T. J. Gallagher has been appointed sales manager in charge of aluminum and magnesium ingot and aluminum and magnesium product sales, with offices located at 160 North La Salle Street.

(Continued on page 266)

KEROTEST \overline{m}

A COMPLETE
LINE OF

for Precision Control
of GAS·LIQUIDS·AIR
etc. throughout
Industry



specifications for quotations

MED TEST MAN

KEROTEST MANUFACTURING COMPANY, PITTSBURGH, PA.

Valves...

Accessories...

Fittings...

ORIGINATORS OF "THE PATENTED DIAPHRAGM" PACKLESS VALVE

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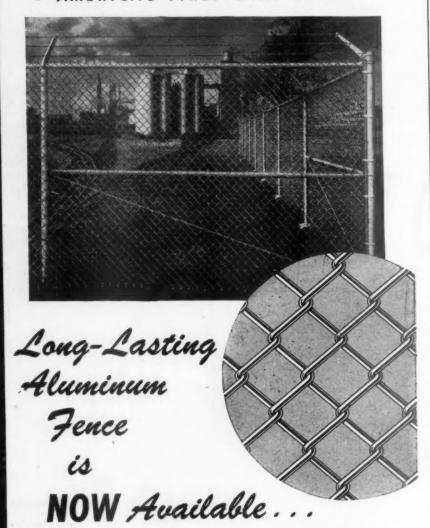
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DAGE FENCE-Since 1883

· AMERICA'S FIRST WIRE FENCE ·



● PAGE, first to offer chain link fence of aluminum wire, now announces availability of this superior, long-lasting fence of heavy gauge wire to those who are entitled to proper priorities. Complete information, cost estimates on either aluminum or galvanized steel chain link fence, and priority assistance, can be had from the Page Fence Association member nearest you. If you do not know the name and address of this fence engineering and erecting firm, write or wire to the PAGE FENCE ASSOCIATION district office in Atlanta, Bridgeport, Chicago, Denver, Pittsburgh, New York or San Francisco, and your inquiry will receive immediate attention. PAGE FENCE ASSOCIATION, Headquarters: Monessen, Pennsylvania.

(Continued from page 264)

Pittsburgh Plate Glass Company, Chicago office. Walter T. Johnson has been advanced to the position of district sales manager for the Columbia Chemical Division.

Electric Auto-Lite Company, Toledo. Thomas W. Flood has been elected vice-president in charge of original equipment sales in the company's plants throughout the United States and Canada.

General Electric Company, Kansas City office. H. A. Warren has been named manager of a new sales district, the Central District, with headquarters in Kansas City.

Goodyear Tire & Rubber Company, Chicago office. After several years in the U. S. Army, Joseph Neiberding has returned as a field representative for the Mechanical Goods Division.

Reliance Electric & Engineering Company, Chicago office. R. O. Herbig, formerly district sales manager, has been appointed central western sales manager.

Choin Belt Company, Knoxville area. Martin Machinery and Supply Company, Knoxville, Tenn., has been appointed as distributors of the complete line of Rex Construction machinery.

Gardner-Denver Company, New York office. Gilbert H. Gaus has been named manager of the branch office at 76 Ninth Ave., to succeed G. V. Leece, vice-president, who has been placed in charge of the company's export division.

*Boice-Crone Company, Toledo office, Myron H. Buehrer, who served as sales manager has been elevated to the position of general manager.

American Chain & Cable Company, New York office. Alton P. Hall has been appointed general manager of sales, with headquarters at 230 Park Avenue.

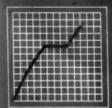
Prest-O-Lite Bottery Company, Chicago and Atlanta divisions. W. J. Mergard has been named manager of the Chicago division, and D. E. Sanders has been appointed manager Atlanta division.

INDUSTRIAL DEVELOPMENTS

American Oil & Supply Co., Newark, N. J., is celebrating its 50th anniversary. The company was founded on February 26, 1895, by William F. Hoffman for the manufacturing and sale of petroleum products. The charter was amended to include paints, colors, acids and chemicals in 1898. In 1902 the company entered the jewelry and silversmith supply business, buying out the firm of W. F. Renziehausen & Co., Newark. The company now occupies a 4½ acres site at Newark, and in addition has a branch office and

(Continued on page 270)





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These are the good reasons why gearhead motors met with such immediate success when The Master Electric Company originated and pioneered the first line of gearhead motors, years ago.

These are the good reasons why more gearhead motors in use today carry the Master name than all other makes . . . COMBINED

These are the good reasons why Master Gearhead Motors will help you save money and still add greatly to the convenience, compactness and safety of your motor driven machinery. For best results, use them for either your plant or your products.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO









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vark, sary. uary for leum d to emiDROP-FORGED STEEL

Flanges

The widespread use of Phoenix Drop-Forged Flanges and the consistently increasing demand for them prove conclusively that they meet the most exacting requirements in every respect. They are drop-forged from a mild steel especially suited to welding and machining and are available in a wide range of styles and sizes. They can also be furnished in stainless steel, Everdur brass, and other alloys.

Every Phoenix Flange complies with ASA requirements and ASME and ASTM specifications.

Ask your supplier for Phoenix Drop-Forged Flanges or write direct for our catalog.

Flange Division of

PHOENIX MANUFACTURING COMPANY CATASAUQUA, PA. JOLIET, ILL.

PHOENIX

Drop Forged

FLANGES

AN important step to lower production costs is to set like standards for all metal cutting operations in all departments.

To efficiently maintain these standards, all classes of metal cutting tools will need to be uniform in performance.

Standard Shield Brand Drills, Reamers, Taps, Dies and Cutters are uniform in performance. They are all made in the same plant—under the same supervision, the same scientific laboratory controls, the same rigid inspection, to the highest quality standard.

Standardizing on Standard Shield Brand Tools of the classes shown will assist you to establish and maintain uniform standards of performance in all metal cutting operations—cost saving results should follow.

Leading mill supply dealers from coast to coast furnish Standard Shield Brand Drills, Reamers, Taps, Dies, Cutters and Special Tools. They will appreciate your inquiry.

STANDARDIZE for

LOWER



CLEVELAND

NEW YORK STORE

DETROIT STORE

CHICAGO STORE

APRIL.



These strong protective, work gloves are the product of one of America's largest textile mills. They are Riegel-controlled - in one plant-from raw cotton to finished glove. This single close supervision of every detail results in unexcelled quality-durability-economy.

"The Right Glove



RIEGEL TEXTILE CORP. 342 MADISON AVE. NEW YORK 17, N.Y.

(Continued from page 266)

warehouse in Trenton. An ever growing technical staff is maintained and new equipment and facilities are constantly being added. American Oil & Supply Co. is supplying various branches of the armed services and defense plants with rust preventive compounds, gun oils, preservative lubricants, and rifle bore cleaners. The present officers, with one exception, have all grown up in the business. They are: William Ulrich, president since 1939, has been with the company since 1903. Edgar F. Hoffman, who was made vice president and treasurer in 1939, joined the company in 1902. Harold A. Dwyer, secretary and comptroller, a former official of the National City Bank of New York, joined the company in 1938. Walter M. Hoffman, Director of Purchases, and William F. Hoffman, Jr., a vice president of Irvington Varnish & Insulator Co., and son of the founder of the company, complete the board of directors. Purchasing Director Hoffman started with the company as a salesman in January 1918, and "was on the road" until April 1930. At that time he was made assistant purchasing agent to A. A. Hoffman. In 1938 the latter retired and W. M. was appointed in his place, and in 1939 he was elected to the board of directors.

Oakite Products, Inc., New York. Dr. Donald Price, formerly associated with



the Interchemical Corporation and National Oil Products Co., has been appointed Technical Director. He will direct Oakite's chemical and mechanical engineering staff including its research laboratory.

Stewart-Warner Corp., Chicago, Ill. Three appointments illustrative of Stewart-Warner's practice of appointing men "up from the ranks" to key positions, are announced as follows: Arden LeFevre, who joined the company in 1925, has been made vice president and director of Division One (alemite, instruments and radio); Fred R. Cross, who joined the company in 1924, has been made advertising manager; and George W. Oehlsen, Jr., who commenced with the company in 1925, has been made assistant director of engineering, Division One.

Westinghouse Electric Elevator Co. Announcement is made of the creation of two separate separative divisions, namely the Air Conditioning and the Elevator Divisions. Ross Rathbun has been appointed manager of the expanded Air

(Continued on page 270)

STANDARD LADDER RAILS

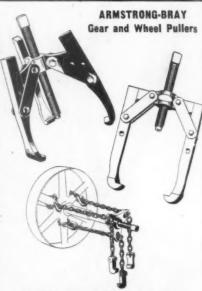
Shoe or base is made of gauge and the side plates are of # 13 gauge steel. Suction grip threads are renewable. Lock nuts and spring washers insure proper adjustment Easy to install. . . .





"Listed by Underwriters' Laboratories Inc." WRITE FOR BULLETIN NO. 4 TODAY

DAYTON SAFETY LADDER CO. 2337 Bilbert Ave., Cincinnatt 6, Ohlo



PROMPT SHIPMENTS FROM STOCK - ESSENTIAL TOOLS TODAY

because they save hours of time, prevent costly breakage and long shut downs. COSLIP Dreakage and long shut downs.

STEELGRIP Standard Rigid Arm Gear and Wheel Pullers are of improved design. Will not slip from work. Arms are forged and heat-treated. 2-arm, 3-arm and special models. 12 types and sizes.

CHAINGRIP Universal Pullers pull wheels, solid gears, pinions, etc., even at considerable distance from end of shaft. Proof-tested chains have both chain hooks and special pulley hooks. 3-ton and 12-ton capacities.

Write for Catalog Sheets.

ARMSTRONG-BRAY & CO.

'The Belt Lacing People

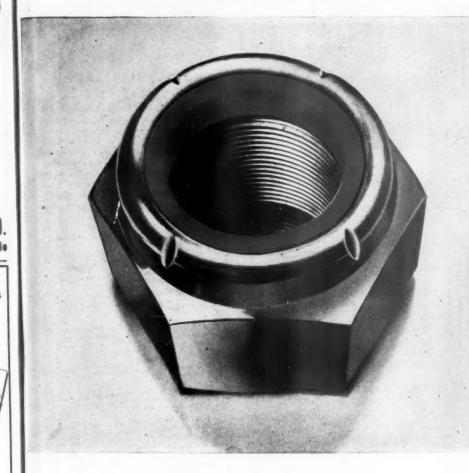
5378 Northwest Hwy., Chicago 30, U. S. A.

The put in tough Built

Stop . elastic This o vidua The 1

off un Wher IT'S THE NATURAL THING

- for a flexible coupling



ESNA recommends Elastic Stop

ESNA recommends Elastic Stop
Nuts for both alignment and
flexible alignment couplings
that operate under conditions
of vibration, impact, shock
or stress reversal. Let us send
an application engineer to
discuss the Elastic Stop Nut
way of avoiding possible nut
failures on your flexible couplings—failures that may cause
costly shutdowns or damage
to equipment.

The Elastic Stop Nut uses its head. It has what it takes to stay put in a coupling, no matter how tough the operating conditions.

Built into the head of every Elastic Stop Nut is a locking device — an elastic compression collar.

This collar forms itself to the individual bolt thread, grips it tight. The nut won't loosen up or back off under conditions of severe vibration, shock or impact.

When you use Elastic Stop Nuts

you need no cotter pins, no lockwashers or any other auxiliaries with their attendant increase in assembly and servicing costs. And you can turn them up to the torque you need and be sure they will stay there. No backing up or straining to find a cotter-pin hole. They can be used over and over again yet still lock. You can use them on any standard bolt.

Here is sure insurance against loose nuts which will result in reduced coupling maintenance costs.



ESNA

ELASTIC STOP NUT CORPORATION OF AMERICA

Union, New Jersey and Lincoln, Neb.

Sales Office-1060 Broad St., Newark 2, N.J.

ELASTIC STOP NUTS
Lock Fast to Make Things Last

APRIL,

BALL BEARING LUBRIPLATE



FOR ALL TYPES OF ANTI-FRICTION BEARINGS

BALL BEARING LUBRIPLATE is a single grease type lubricant developed for general use on roller, ball and plain sleeve bearings operating at speeds up to 5000 RPM and at temperatures up to 300° F. Its performance is outstanding. BALL BEARING LUBRIPLATE not only does a better lubrication job, but it definitely gives protection against the arch enemy of bearings . . corrosion. Increase the life of your bearings with LUBRIPLATE.

LUBRIPLATE

Lubricants definitely reduce friction and wear to a minimum. They lower power costs and prolong the life of equipment to an infinitely greater degree. LUBRI-PLATE arrests progressive wear.

LUBRIPLATE

Lubricants protect machine parts against the destructive action of rust and corrosion. This feature alone puts LUBRIPLATE far out in front of conventional lubricants.

LUBRIPLATE

Lubricants are extremely economical for reason that they possess very long life and "stayput" properties. A little LUBRI-PLATE goes a long way.

Write for a booklet, "The LUBRIPLATE Film", written especially for your industry.

NISKE PROTHERS REFINING CO.
MENARY S. M. I.
TOLEDO S. OMIO

DUR 75 MYEAR

1870-1945 REALIES FROM COAST TO COAST

(Continued from page 270)

Conditioning Division. Walker G. White, formerly sales manager, has been named manager of the Elevator Division.

E. I. du Pont de Nemours & Co. Announcement is made of plans for the construction of a new plant near Orange, Tex., to boost nylon production for military purposes at the specific request of the government. The project is estimated to cost \$20,000,000.

Lapointe Machine Tool Co., Hudson, Mass. Don E. Miller has been appointed execu-



tive assistant to Vice President and Works Manager John J. Prindiville, Jr. He formerly was factory manager of the Garfield Division at Houdaille-Hershey Corp.

Wolter Kidde & Co., Inc., Belleville N. J., announce the purchase of the capital stock of the Youngstown Miller Co., Inc., formerly of Sandusky, O., manufacturers of plastic coaters and oil reclaimers. John F. Kidde is president; F. L. Gerin, vice president and general manager; Harold A. Cartier, vice president; R. E. Strobel, sales manager. Main office of Youngstown Miller Co. is at 675 Main St., Belleville, N. J.

Trent Tube Manufacturing Company, East Troy, Wis. Frank G. Flocke has been made general manager.

Monroe Auto Equipment Co., Monroe, Mich. Announcement is made of the purchase of the plant and facilities of the Stoner-Maurer Co., manufacturers of materials-handling equipment.

Titonium Alloy Mfg. Co., Niagara Falls, N. Y., announces broad expansion of its research and laboratory facilities, and its technical staff, by the addition of six competent men in the analytical field, five outstanding ceramic engineers, plus men noted for their achievements in the field of chemistry.

Higgins Industries, Inc., New Orleans, La., builders of landing craft, etc., will enter the post-war electric appliance field as distributors of Electromaster products.

George Scherr Co., Inc., New York, N. Y. Announcement is made of the establishment of a machine and precision instrument exhibit at 200 Lafayette Street, New York, N. Y. The company specializes in measuring and inspection tools.

LUBRIPLAT No. 205



MAKE ONE BEARING OUTLIVE TWO

LUBRIPLATE No. 205 is a lubricant developed for use in grease type anti-friction bearings operating at speeds from 5000 RPM to 20,000 RPM. Users of high speed machinery tell us that this remarkable lubricant often more than doubles the life of bearings. For the lubrication of anti-friction bearings with oil type housings LUBRIPLATE No. 1 or No. 2 is recommended depending upon the operating speed.



No. 3—ideal for general oil type lubrication. Ring eiled bearings, wick feeds, sight feeds and bettle ellers.

No. 8—Because of its high film strength and long life reflects outstanding performance in most types of enclosed gears (speed reducers).

No. 107—One of the most popular grease type products for general application by pressure gun or cups.

No. 70—For a wide range of grease applications, especially at temperatures above 200 degrees F.

No. 130-AA—Knewn nationwide as the superior lubricant for open gears, heavy duty bearings, wire repe, etc.

BALL BEARING—This is the LUBRI-PLATE lubricant that has achieved wide acclaim for use in the general run of ball and roller bearings operating at speeds to 5000 RPM and temperatures up to 300 degrees F.

Write for a booklet, "The LUBRIPLATE Film" written especially for your industry.

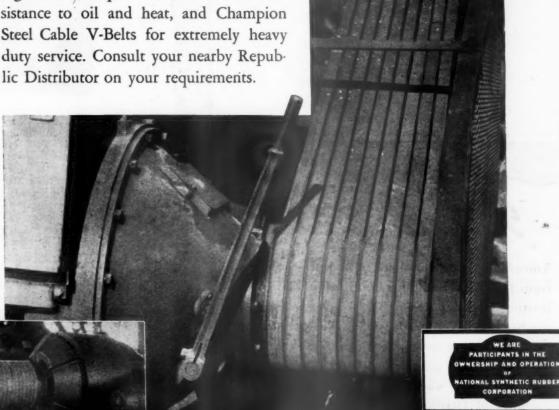


Champion Endless Cord Endless Construction Construction MA Designed with high-tensile, preAN

Designed with high-tensile, prestretched, continuous cords imbedded in rubber, Republic's Champion Multiple-V Belts have the ability to handle peak loads without stretching and yet retain elasticity and flexibility

Republic also offers Champion V-Belts on special order for special services: Static Control V-Belts for elimination of sparking hazards, Reprene Cord V-Belts for resistance to oil and heat, and Champion Steel Cable V-Belts for extremely heavy duty service. Consult your nearby Republic Distributor on your requirements.

MATCHABILITY
AND MULTIPLE
EFFICIENCY



BETTER THAN BEFORE

REPUBLIC RUBBER

LEE RUBBER & TIRE CORPORATION

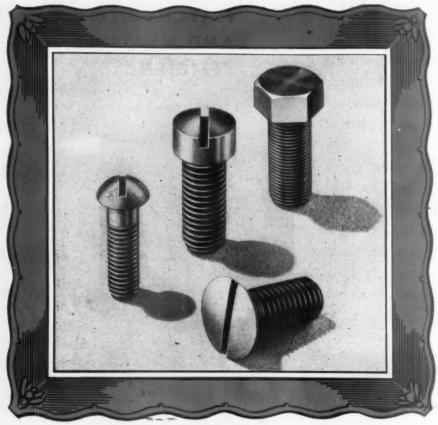
YOUNGSTOWN 1 OHIO

REPUBLIC INDUSTRIAL PRODUCTS
YOUNGSTOWN, O.



CONSHOHOCKEN, PA

Triplex Cap Screws...



In all heads

You can get your complete cap screw requirements from TRIPLEX, including Flat heads, Filister heads, Button heads, as well as Hex heads. Regardless of the head style you need, you get TRIPLEX quality. Precision fitting heads, free running threads, and toughness that brought TRIPLEX preference on many types of war equipment used around the world. Send TRIPLEX your inquiry. Write for new wall chart, covering all standard specifications for threaded fasteners.

THE TRIPLEX SCREW COMPANY

5331 Grant Avenue, Cleveland 5, Ohio

THREADED
FASTENERS
CAPAND SET SCREWS - BOLTS, NUTS AND RIVETS

Westinghouse Electric & Mfg. Co. Announcement is made of the purchase of the Atlantic Elevator Co., acquiring all assets and control of the plant in Philadelphia, Pa. Fred B. Brust, first vice president of the Atlantic Company, will continue as manager of the new Westinghouse operation. Headquarters of Westinghouse Electric Elevator Co. are at Jersey City, N. J.

General Fireproofing Co., Youngstown, Ohio. H. H. Saunders has been appointed advertising manager, succeeding W. S. Miller who resigned to accept a position with the U. S. Treasury Department.

Square D Company. T. B. Martin has been made Director of Advertising for



both the Detroit and Milwaukee electrical divisions, with headquarters at Milwaukee. Dwight A. Roehm will continue activities for the Detroit plant with the title Advertising Manager, Detroit Division. And, J. Clifton Carr continues as advertising manager of the Kollsman Division with headquarters in Elmhurst, N. Y. Frank Robey has rejoined the Square D Company as sales manager of the Industrial Controller division, with headquarters in Milwaukee.

Edwards & Co., Norwalk, Conn. Arrangements have been concluded with the Warren Telechron Co. whereby Edwards & Co. will sell Telechron program and clock systems. The Edwards company will manufacture its own line of program and clock systems using Telechron motors and mechanisms.

Faraday Electric Corp. The Stanley and Patterson Division of the Faraday Electric Corp. has moved to 434 Newbury St., Boston, Mass. The machinery and personnel of the Holtzer-Cabot Signal Division as well as equipment and personnel from the Faraday plant at Adrian, Mich., will be combined at the new address. Paul E. Freiwald is sales manager of this division, and George Rick is in charge of manufacturing.

General Electric Co. Ralph J. Cordiner has been elected vice president and assistant to the president of the General Electric Co. He has been assistant to the president for the past 18 months, since his resignation as vice chairman of the War Production Board.

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UNI

We're on the job... DAY AND NIGHT!



11:30 one Saturday night, our Twin City manager received an gent call at his home. An alloy steel shaft was needed to repair a eakdown that was delaying operations at an important iron mine. Our men got on the job and got the steel ready. The mine sent a ack to our warehouse at 4:30 A.M. to pick it up—getting back to the ine at 8:00 A.M. Another example of the teamwork that makes our rvice to customers so outstanding.

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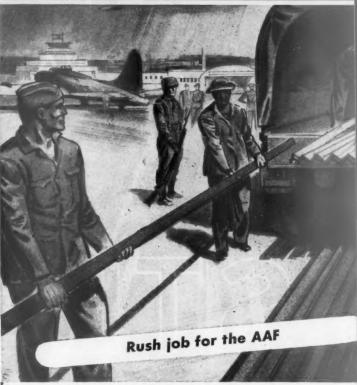
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At noon, one Saturday in September, 1944, a call came to our St. Louis warehouse from an Army Air Field. Could we cut some 18,000 lbs. of steel angles into 20-foot lengths and load them onto an Army truck at 8:00 A.M. Sunday? We could and we did—meeting an important emergency.

Service <u>really</u> makes a difference...Call us

WE have a large variety of steel in our warehouses available for quick shipment. These include NE Alloy Steels and one of the largest and most complete stocks of Stainless Steels to be found in the country. When you need steel quickly, phone, write or wire our nearest warehouse. We will do our best under today's difficult conditions to speed delivery. Our service may help you untangle a production tie-up—avoid serious delay on a war job. All inquiries receive careful attention and quick action.

UNITED STATES STEEL SUPPLY COMPANY



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BOSTON (34), 176 Lincoln St., Allston, P. Q. 8ox 42 STAdium 9400

CLEVELAND (14), 1394 E. 39th St., HEnderson 5750

MILWAUKEE (1), 4027 West Scott St., P. O. 8ox 2045 Mitchell 7500

NEWARK (1), N. J. Foot of Bessemer St., P. O., 8ox 479 Bigelow 3-5920

REctor 2-6560 • BErgen 3-1614

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Why Heavy Duty Forgings Should be NATIONAL FORGED

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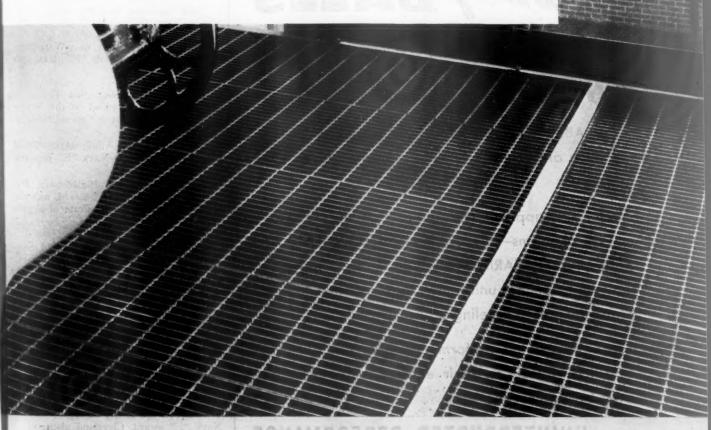
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Give a man a footing he can trust...and he'll do a better job with greater safety. Blaw-Knox non-slip Electroforged Steel Grating is today giving surefooted protection to crews of merchantmen and freight trains, to workers in plants everywhere, to fighting men crossing bridges hastily thrown over rivers by our army engineers. In Stair Tread, Flooring, Catwalks, Running Boards, in dozens of other places...the twisted bar, one-piece self-cleaning construction gives strength and safety in any weather.



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APRIL



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With ABBOTT BEARING BALLS, all types of products are achieving uninterrupted performance.

Heavy duty applications, light assemblies, intricate mechanisms—all carry the load as planned with ABBOTT BEARING BALLS on the job. They have the stamina, uniformity, and precision to stand the gaff of grueling service.

For uninterrupted performance start ABBOTT BEARING BALLS on their endless journey in your bearing races.

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Specify "ABBOTT" and be sure

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ARMY - NAVY - MARINE MERIT AWARDS



Veterans of World War II, honorably discharged from the armed services, accept for war workers the fourth Army-Navy "E" award received by the Brown Instrument Company, Philadelphia.

Black & Decker Mfg. Co., Towson, Md. Third renewal of the Army-Navy "E" award.

Edwards and Co., Inc., Norwalk, Conn. Fourth star for Army-Navy "E" flag, and four renewals of the Maritime "M".

Clark Equipment Co., Buchanan, Mich. Army-Navy "E" pennant.

Chose Bross & Copper Co., Waterbury, Conn. New Army-Navy "E" flags with five stars.

Standard of California, San Francisco, Calif. Fourth star added to the Army-Navy "E" flag at the Richmond refinery.

L. S. Starrett Co., Athol, Mass. Third white star for Army-Navy "E" pennant.

Brown Instrument Co., Philadelphia, Pa. Fourth Army-Navy "E" award, and the National Red Cross certificate of appreciation for blood donations.

Chas. D. Briddell, Inc., Crisfield, Md. Second renewal of Army-Navy "E" award.

Sparks-Withington Co., Jackson, Mich. Army-Navy "E" flag for their five plants.

Acushnet Process Co., New Bedford, Mass. Fourth star for its Army-Navy "E" hanner.

Lapointe Machine Tool Co., Hudson, Mass. Third Army-Navy production award.

Willard Storage Battery Co. Third Army-Navy "E" award, Cleveland plant.

Hercules Powder Co., Wilmington, Del. At the close of 1944 17 Army-Navy "E" awards and 31 stars. These plants are the Badger Ordnance Works, Baraboo, Wis.; the Missouri Ordnance Works, Louisiana, Mo.; the Radford Ordnance Works, Radford, Va.; the Sunflower Ordnance Works, Lawrence, Kan.; and the Volunteer Ordnance Works, Chattanooga,

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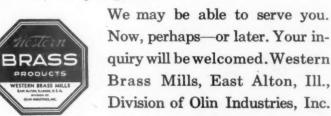
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Better Metals for Many Uses

Precision-made brass and other Western copper-base alloys will serve important functions in a large number of tomorrow's

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WESTERN BRASS MILLS

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BRASS . BRONZE . PHOSPHOR BRONZE . NICKEL SILVER . COPPER



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Swiss-Pattern Files speed up filing operations because of their specially keen filing edges . . . their exceptionally large filing surface . . . their thorough and uniform hardness.

Many an enthusiastic user has told us that "AMERI-CAN SWISS" Files outfile all other makes they have tried. This is the natural result of the skill and care with which these precision tools are made by Swiss-Pattern file craftsmen, and the forty-five years of specialized experience which guide their manufacture.

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NEW JERSEY



WPB-OPA DIGEST

Acid Fluorspar Tight—WPB—While supplies of acid grade fluorspar are adequate at the present time to meet the minimum basic essential requirements, it is expected that the demand for it will increase substantially and that supplies of this mineral for non-essential uses will not be available for some time to come.

Slob Zinc Under Allocation—WPB—Through an amendment to Order M-11, effective April 1, 1945, slab zinc has been placed under allocation controls similar to those in operation from June 1942 to September 15, 1944. Resumption of allocation, controls is necessitated by increasing ammunition requirements and other war needs.

Spot Authorizations More Flexible—WPB—Priorities Regulation No. 25 governing operations of the spot authorization procedure, has been amended to make its application more flexible by permitting authorization of civilian production that is not prohibited or limited by an L (limitation) or M (conservation) order of WPB.

Southern Hardwood-OPA-General price increases at the mill level averaging \$3. a thousand feet board measure on hardwood lumber produced in the Southern region have been authorized by the Office of Price Administration. The increases are the minimum required by law. They will permit a 75% minimum of output to be produced without financial loss, OPA said. Amendment 16 to Revised Maximum Price Regulation 97.

Quebracho Extracts Get Price Adjustments— OPA—Grinders and liquefiers of imported solid quebracho extract—a vegetable tanning material—have been granted increases in their present ceiling prices. Amendment 6 to MPR 531.

Building Materials Division—WPB—Appointment of Warren Spencer as director of the Building Materials Division of the War Production Board, to succeed John Haynes who was named director of the Construction Bureau last December, is announced by Harold Boeschenstein, Operations Vice Chairman of WPB.

Order N-138 (istle) has been amended to remove restrictions on the processing and delivery of istle and istle products and on the use of damaged istle. Only the inventory reporting provisions of the order have been retained.

Rosin and Nitrocellulose Plastics—WPB—Gum rosin, wood rosin and nitrocellulose plastics have been placed under the controls of order M-340, governing miscellaneous chemicals.

Concellation of Steel Purchase Orders— WPB—In order to assure that maximum effective use is made of steel producing (Continued on page 284)





Industry today, more than ever before, is using Personnel Service, Safety and Sales Incentive awards because employees RESPOND favorably to them. Stimulate better employer-employee relations in your plant by the use of Morgan's awards. Prices depend on design and quantity involved. We will gladly design your own individual award to your specifications, in sketch form as shown above, at no obligation. Write for illustrated folder.

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BY ALL MEANS-BUY BONDS!

APRIL,

TWIN-FAST's Centered Point, Sharp Threads and Balanced Construction Prevent Cant— Save Assemblies!

The sharp centered point of Twin-Fast Screws is a "safe starter"—bites into the wood at first pressure and goes the full way in, at twice the speed! Avoids "crawling" which may occur when using the ordinary screw with its eccentric gimlet point. Each Twin-Fast thread is opposed by the parallel twin thread (rather than a groove), providing balanced construction for straight driving. These are some of Twin-Fast's features which safeguard against cant, inaccurate seating of head or misalignment.

Twin-Fast Screws cost no more and provide extra dividends in time conserved, trouble avoided and assemblies saved. Test these wood screws in your own plant. Samples sent on request.

Other Twin-Fast Features

Twin, parallel threads provide twice the thread pitch of ordinary screws. Driving time and costs are cut in half!

Relieved shank diameter prevents stresses which might cause immediate or eventual splitting or fissures. Cylindrical construction (not tapered) increases thread area for tighter seating, greater holding power. Often, fewer and shorter screws may be used.

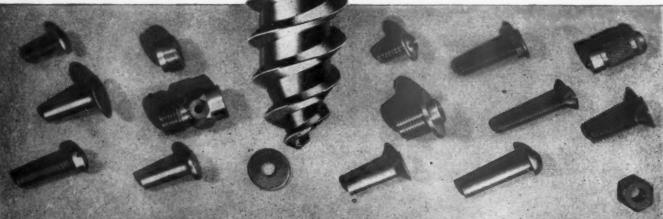
Twin-Fast Screws come in steel or brass with round, flat or oval heads—standard sizes and thread count.

For Faster Production - Sounder Construction -

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Patents 2,314,390; 2,314,391. Other pats. pending



The Blake & Johnson Company makes many thousands of different types of fastening devices in all standard metals.

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How much are You paying

FOR INDUSTRIAL TRUCK MAINTENANCE?



compare Your Costs WITH THESE:

The rugged construction of Baker Trucks, and the easy accessibility of all parts requiring service, result in unusually low maintenance costs. The following actual records are typical of many where regular inspection and lubrication are a matter of routine.

A midwestern railroad paid a total of \$144.70 for replacement parts for two Baker Trucks which were in continuous service over a period of 7 years, 4 months—an average of only 82c per month per truck.

A large motor truck manufacturer with a fleet of Baker Trucks, reports that during the last 5 years the total maintenance expense, on a truck purchased 26 years ago, exclusive of tires, has not exceeded \$50.00 per year.

A large aircraft parts manufacturer bought 11 Baker Trucks 3 years ago for his huge new plant. Trucks operate 24 hours a day under most severe conditions. During the last 12 months (3 years of normal service) maintenance costs averaged \$550.00 per truck-a remarkable record considering that they had seen the equivalent of 9 years of gruelling, uninterrupted service.

A wire mill reports that their Baker Truck, purchased in 1918 is still in regular service, and that maintenance cost-exclusive of tires-has been less than \$50.00 per year for the last 5 years.

A food canner using a Baker Hy-Lift Truck purchased in 1931, writes: "Our superintendent tells us that surprising as it may seem, no new parts are necessary. Your representative told us what adjustments could be made-and it seems that they could do it right at the cannery. It looks like this is just one more blue ribbon for Baker. It is amazing that after all these years a general replacement of essential parts is unnecessary."

A brass fitting manufacturer reports that his 4 Baker Trucks, in continuous service for 3 to 5 years have required no overhaul—and factory replacement parts, exclusive of tires, have averaged about \$10.00 per year per truck.

A Baker Truck operating nearly four years in the plant of a transportation equipment manufacturer, has needed no major overhaul. Maintenance costs, in spite of severe service conditions, have totaled only \$150.91-less than \$40.00 per year

To help you reduce maintenance costs on your individul trucks, write for "Industrial Truck Care Pays You Dividends."

BAKER INDUSTRIAL TRUCK DIVISION of The Baker-Raulang Company

2148 West 25th Street • Cleveland, Ohio

In Canada: Railway and Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

(Continued from page 280)

facilities in the United States, WPB has called upon industry to cancel all purchase orders that have been placed on steel mills and are not now valid because of production program adjustments.

tumber for Millwork-WPB-Use of lumber for only the most essential types of millwork was recommended by the Millwork Industry Advisory Committee at recent meeting.

Pig Iron Ceiling Prices Increased—OPA—An increase of \$1 per gross ton in basing point base ceiling prices for pig iron has been announced by OPA. Amendment 10 to revised price schedule 10—Pig Iron.

Used Iron & Steel-OPA-Steps to be taken to bring the sale of all used iron and steel products under one regulation were discussed by the Reusable Iron and Steel Industry Advisory Committee.

Lightweight Building Board—WPB—Research sponsored by WPB on the use of fibers in making cement-bonded lightweight building board will aid in the wartime rebuilding of blasted villages on Guam, in the South Pacific, the WPB Office of Production Research and Development reports. (Coconut fiber may be used with cement and other materials.)

Steel "Interim Increase"—OPA—Warehouses and jobbers of iron and steel products were authorized by OPA to pass on to their customers the "interim" increase in mill ceiling prices for four basic steel products which became effective January 11, 1945, and which they have had time to absorb. (Amendment No. 12 to Revised Price Schelule No. 6; Amendment No. 29 to Revised Price Schedule No. 40; Amendment No. 15 to Second Revised Maximum Export Price Regulation, all effective March 1, 1945.)

Steel Tighter in 2nd Quarter—WPB—Production difficulties, manpower shortages and increasing military demands for copper, steel and aluminum have resulted in a tighter controlled materials situation for the second quarter of 1945 that at any time during the last several quarters with the result that some war procurement agency production programs may have to be modified.

Motors, Advance Purchase Authorizations—WPB—To allow commercial type electric motor manufacturers more time to plan their schedules, WPB will give motor users advance authorizations to purchase for two quarters. Previously, advance authorizations were granted only for one quarter.

Clarify Accounting Practices—OWI—To clarify accounting practices connected with contract settlements and assure greater uniformity in their application. Regulation No. 14, dealing with Termination Cost Memorandums, has been issued by Robert H. Hinckley, Director of Contract Settlement.

(Continued on page 286)

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To insure top quality in all Aristoloy Steels our facilities enable us to roll, or press forge. The photo shows a 1000 ton steam hydraulic press for forging special shapes and also to forge steels that are difficult to roll ... but most important — to obtain better physical properties and supply the best in electric furnace steels.

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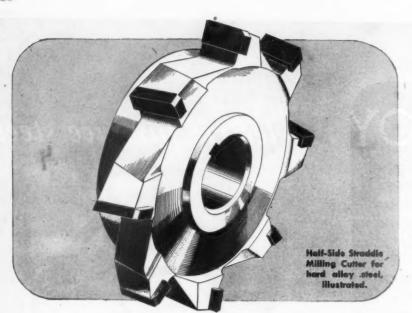
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INCREASE PRODUCTION as many as IO TIMES

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IT'S EASY to increase production as many as 10 times with Wendt-Sonis Standard Milling Cutters. These new milling cutters employ a negative radial and helix angle feature on the cutting edge for milling steel; positive angle for milling non-ferrous materials.

Distinctive Advantages of W-S Milling Cutters

INCREASED SURFACE FEED—Machines hard alloy steel up to 750 surface feet per minute; non-ferrous materials up to 3400 surface feet per minute.

PREVENTS VIBRATION—The built-in heavy lug fly-wheel prevents vibration, adds strength to cutters; lengthens life of tool between sharpenings.

especially designed—for carbide cutting—not just a HSS design with carbide tips. Recommended for milling all types of material.

EASILY RESHARPENED—on any universal tool and cutter grinder.

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Foreign Silver—WPB—The import flow of foreign silver has steadied down to a point sufficient to permit revision of some lists of essential war products that may be made from the lower-priced foreign metal.

Spot Authorizations Extended 90 Days-WPB-A 90-day extension of the rules limiting spot authorizations of civilian goods production in critical labor is announced by WPB.

P. D. Wilson Assistant to Krug—WPB—Philip D. Wilson of New York City, vice chariman of the Office of Metals and Minerals of the WPB, has been named special assistant to WPB Chairman J. A. Krug to survey critical and strategic metal situations. He will be succeeded as vice chairman by William C. Keeley.

Bolivian Tin Price Increased—OWI—The price to be paid for Bolivian fin during the remainder of the basic tin agreement between Bolivia and the United States will be increased from 60c to 63½c, according to announcement by Leo T. Crowley, Foreign Economic Administrator.

Order M-371 Revoked—WPB—In view of increased military needs for trichlorethylene and perchlorethylene, Order M-371 governing these chemicals has been revoked, and controls transferred to Order M-300, the general chemicals allocation order and tightened the restrictions relating to both.

Priorities to Governments on Surpluses—OWI—The Surplus Property Board points out that section 13 of the Surplus Property Act of 1944 provides that time priorities shall be given to states, local governments, tax supported and non-profit institutions for the purchase of surplus property. Regulations to effectuate this provision of the law are being prepared by the board.

Lumber Decrease—WPB—Lumber authorized for distribution in the second quarter of 1945 totals 7,762,000,000 board feet, plus a contingency reserve of 738,000,000 board feet, according to WPB. Production for the second quarter is expected to be approximately 12% lower than normal output for that period, and a rise in military requirements is anticipated.

Rosin Quoto Established—WPB—Because inventories of gum and wood rosin are at a dangerously low point and production is expected to continue to drop as a result of manpower shortage, WPB has issued Order M-387, establishing quotas of rosin that may be used in the production of all but "preferred orders."

Phenolic Resin—WPB—Small order quantities of phenolic resin and phenolic resin compound may be accepted by manufacturers to complete current jobs for which materials of the same type had been specifically allocated, according to an amendment to Schedule 87 of Order M-300.

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Make quickly in your own plant TITE-SEAL Cellophane Bags of any size that seal out dust, air, water and moisture-vapor. They protect military supplies from damage in transport or storage.

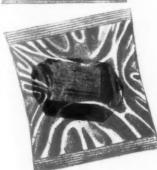
Acceptable for Methods I and IA, type III packaging . . . available in 3, 4, 6 and 8 inch widths under proper priority . . . 1000 feet to the reel. Saves stocking large quantities of special-sized bags. (Stock Bags also available in above widths.)

"All-Size" Containers and custom made bags can be furnished plain or printed in any widths or lengths desired on special orders of sufficient quantity.

Heavy foil-lined laminated bags or tubes meet every requirement of Methods I, IA and II Military Packaging. LOXTITE Partitions give crash protection to fuses, rations, and delicate or fragile items.

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Protecting workers' hands with
their cushiony, loop-finished
cloth...saving man-hours and
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TRY JOMAC GLOVES—Test them in your own shop—on your toughest jobs. Check them for wear, for washability, for increased production. Write for full details. C. WALKER JONES CO., Philadelphia 38, Penna.

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Three Types of Jomac Gloves

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CONTRACT SETTLEMENT TRAINING GUIDE

To prepare war contractors for handling contract settlement, a new contract Settlement Training Guide has been published by the Contract Settlement Advisory Board's Committee on Training, the Office of Contract Settlement announces. This booklet is designed to provide basic information for termination coordination committees, which have charge of local contractor training programs.

The new program built around a four-hour course for contractors, makes a departure from previous contract settlement proposal forms and solving practical problems dealing with such subects as termination inventories, scrap disposal, etc. The new short course is part of the nation-wide program to assist all war contractors, whether prime or subcontractors, to obtain settlement if their war contracts should be terminated.

Worked out jointly by representatives of the War, Navy, and Treasury Departments, United States Maritime Commission, Reconstruction Finance Corporation, War Production Board, Smaller War Plants Corporation, Department of Justice, Bureau of the Budget, and Office of Contract Settlement, the new publication reflects conformity among Government agencies in contract settlement.

The booklet outlines the procedures and principles to be followed in both national and local training programs.

Brief talks, single-session meetings as well as multiple-session courses, technical sessions on inventory and plant clearance, accounting and other subjects are covered.

Copies are available from the Office of Contract Settlement, Federal Reserve Building, Washington 25, D. C.

SURPLUS PROPERTY PRIORITIES FOR LOCAL GOVERNMENTS

The Surplus Property Board points out that section 13 of the Surplus Property Act of 1944 provides that time priorities shall be given to states, local governments, tax-supported and non-profit institutions for the purchase of surplus property. Regulations to effectuate this provision of the law are now being prepared by the board.

The board declared that restrictive state laws, which prescribe procedures involving competitive bids, posting of notices and public advertising probably would make it impossible for some states, municipalities and institutions to negotiate for purchases of surplus property from the disposal agencies which operate under the board.

States and local governments were reminded of these restrictions some time ago by the Council of State Governments. The Council at that time suggested state legislation which, if enacted, would put these priority buyers in position to exercise their rights under the law.

The Surplus Property Board has taken steps to have this suggested legislation again called to the attention of the state

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These are the things that make America strong...the industries that RB&W has served during its 100 years of developing better fasteners for better products.

NO.1 Agriculture

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The horse-drawn plow of a century ago, with its single share, was once as up-to-the-minute as the great tractor-powered, multi-share plow of today . . . When the makers of farm equipment in 1845 were ready to produce a new plow, they were able to get bolts and nuts that could stand the punishment of the tough, virgin sod . . . And the products of today and tomorrow will find the right bolts and nuts ready for the job . . . because progress in RB&W fasteners has kept pace with industry's technical advancements.

For 100 years, RB&W has been pacemaker in developing

better bolts, nuts and allied fasteners. Progress . . . from the primitive hot header that replaced the blacksmith's anvil . . . to the first automatic cold header developed by RB&W

as early as 1847 . . . and on through today's latest production equipment . . . has been sustained by generous investments in research and development, equipment and plants . . . That's why leaders in farm implements and American industry prefer the RB&W EMPIRE Brand. That's why they and you will welcome new RB&W refinements now in the making that will help make stronger and better products—faster.





RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Factories at: Port Chester, N. Y., Corcopolis, Pa., Rock Fells, Ill. Sales offices at. Philadelphia, Detroit, Chicago, Chartonooga, Los Angeles, Portland, Soattle. Distributions caust to coast. The industry's most complete, easiest-to-use contains.

APRIL, 1

David Dietz, Science Editor of Scripps-Howard, tells of an amazing discovery he made when he visited the world's largest rope plant.



Huge catches of fish seined from the bottom of the sea... men and valuable cargo lifted high above ground... the ropes that daily perform these and hundreds of other important jobs

contain moving parts that need lubrication to ease their burden and prolong their life.

Like the cylinder walls of an automobile, rope needs protection against friction. For as it stretches under tension—as it twists and moves and turns—its strands and yarns rub against each other sidewise and lengthwise. Inside the rope, friction is generated.

Plymouth rope-engineering counteracts this internal friction with lubrication. Before the rope's tiny fibers start through the first rope-making machine, they are bathed in a special Plymouth-developed oil, applied so that every fiber gets its full share.

All Plymouth Rope is scientifically lubricated in this way to give it greater strength, longer life and more useful performance. Wherever rope is used—on sea, on farms, in industry, by the armed forces—you will find Plymouth lubrication at work, protecting life and property.

Plymouth Cordage Company, Plymouth, Massachusetts. District Offices: New York, Chicago, Houston, San Francisco. Warehouse Stocks: New York, Boston, Philadelphia, Baltimore, Houston, Chicago, San Francisco.



ABOVE—This is "sliver" or, "roping" that has been thoroughly lubricated by a secret Plymouth process. It is nearly ready for spinning.

PLYMOUTH

CORDAGE PRODUCTS

ROPE YOU CAN TRUST



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For year have be and fur tinuous balance their s pacity operat

Limite



Whip Any Bad Air Condition

Typical Emerson-Electric heavy-duty exhaust fan installation

EMERSON ELECTRIC HEAVY-DUTY EXHAUST FANS

Exhaust up to 21,000 cu.ft. per minute! Seven sizes—12-inch to 48-inch

In any area where there's objectionable heat, odors, smoke, dust—"give 'em fresh air," and lots of it, with Emerson-Frectric Exhaust Fans. Bad a d

For years, Emerson-Electric Exhaust Fans have been eliminating stagnant air, odors and fumes. These quiet fans operate continuously for long periods of time—their balanced blades minimize vibration—their shaft bearings have lubricant capacity sufficient for at least 2,000 hours operation.

Available on Priority
Limited production of Emerson-Electric

Exhaust Fans has been resumed in popular sizes, suitable for "whipping" any bad air condition. These models are available on priorities, as specified by the War Production Board. Write for complete catalogs X4559 and X4566.

THE EMERSON ELECTRIC MFG. CO. SAINT LOUIS 3, MO.

Branches: New York • Chicago • Detroit • Los Angeles • Davenport



Emerson-Electric Exhaust Fans are powered by specially designed Emerson-Electric Motors, built for continuous heavy-duty service.

428

EMERSON EMERSON ELECTRIC ELECTRIC

APR



BAND SAW BLADES



This type of saw has coarse teeth . . . 2, 3, 4, and 6 per inch.

Especially adapted for soft metals that have a tendency to stick or clog in the Gullets of the saw teeth.

Advantageously used on many operations in sawing.

Non-Ferrous Metals

Aluminum Magnesium Plastics Soft Brass Carbon Brake Lining Hard Rubber Sponge Rubber

Hard Woods

Fibre Asbestos Plywood Builder's Board

Buy Through Your Mill Supply Distributor

AMERICAN SAW & MFG. CO.

SPRINGFIELD 1, MASS.



the proper application of KNO-DRAFT ADJUST-ABE DIFFUSERS in par-

NEW HANDBOOK

SIMPLIFIES SELECTION
AND APPLICATION OF
AIR DIFFUSERS

FREE: To those responsible for air diffusion "design"

And to those who install the equipment and are responsible for its performance.

IT CONTAINS: Clear sketches, charts, dimension prints and instructive text for quick, accurate SELECTION — APPLICATION — LOCATION — ASSEMBLY — ERECTION — TESTING — ADJUSTMENT of air diffusers and of ACCESSORY EQUIPMENT such as dampers air equalizing grids, mounting rings and air sectorizing baffles.

Performance Data
Selection Charts
Air Capacity Tables with
instruction sheets
Damper Setting Chart
Air Direction Adjustment
Chart
Standard Specifications
Complete Price List

All set up in durable

All set up in durable loose-leaf binder to facilitate the insertion of supplementary or revised data which will be forwarded from time to time to those who have sent for this catalog. Write for your free copy to Department F-2.

W. B. CONNOR ENGINEERING CORP.

114 E. 32nd Street



New York 16, N. Y.

(Continued from page 288)

legislatures that are still in session. The board has stated its desire that all states, counties, municipalities and institutions have every opportunity to share in the surplus property which may become available.

MOTOR PURCHASE ADVANCE AUTHORIZATIONS

To allow commercial type electric motor manufacturers more time to plan their schedules, the War Production Board will give motor users advance authorizations to purchase for two quarters, WPB announces. Previously, advanced authorizations were granted for only one quarter, officials explained.

This action was taken because it was found that many of the components needed must be ordered by motor manufacturers weeks or months ahead of the calendar quarter in which the motors and

generators are assembled.

Under the revised order, applications for authorizations will continue to be filed about two and a half months ahead of the first of the two quarters to which the apthorization will apply, instead of 30 days or more ahead of the quarter as was previously the case. Applications must be made on Form WPB-3825 on or before the tenth day of April 1945, the tenth day of July 1945, and quarterly thereafter. No new applications will be required for authorizations for the second quarter of 1945 from applicants who have previously applied, it was explained. WPB will issue this authorization on Form GA-2305, beginning February 22, 1945, on the basis of applications previously submitted. If no application has been submitted previously and a second-quarter authorization is desired, an application on Form WPB-3825 will be required, however.

Control over distribution will be retained since advance authorizations will be subject to reduction, enlargement or other modifications whenever review of the applicant's situation reveals that such action is warranted, officials said. Form WPB-3825 has also been revised

Form WPB-3825 has also been revised and copies of both the revised order and form will be sent to all applicants who have previously applied.

STEEL PRODUCTION

In order to assure that maximum effective use is made of steel producing facilities in the United States, the War Production Board has called upon industry to cancel all purchase orders that have been placed on steel mills and are not now valid because of production program adjustments.

WPB field offices have been instructed to contact at once steel users whose programs have been cut and to work with them to assure that invalidated steel orders are cancelled and that any unused allotments of steel are returned promptly in compliance with controlled-materials plan regulations. Close working arrangements between steel users and WPB field office auditors will aid in early cancellation of invalidated orders, WPB said

If you are designing



Have you explored the possibilities of these special purpose U·S·S STEELS

U.S.S STAINLESS AND HEAT-RESIST-ING STEELS to assure high resistance to corrosion and heat, and to reduce weight.

U·S·S CARILLOY ALLOY STEELS—Special steels for the special jobs of industry.

U.S.S HIGH STRENGTH STEELS to resist corrosion and increase strength without adding weight.

U.S.S ELECTRICAL SHEETS for motors, generators and transformers.

U.S.S ABRASION-RESISTING STEEL to combat wear and friction.

U·S·S HOT-ROLLED AND COLD-ROLLED STEELS to provide the basic advantages of steel, plus maximum economy in ac-cordance with the needs of each job.

U·S·S PAINTBOND-A galvanized, Bonderized sheet that permits impainting and holds paint tighter.

U.S.S VITRENAMEL - Sheets designed especially for porcelain enameling.

U.S.S COPPER STEEL to give at least twice the atmospheric corrosion resistance of regular steel at little additional cost.

remember-NINE TIMES OUT OF TEN

N your drawing boards the world of tomorrow is already taking shape. And rightly so. For who can deny that while our primary effort now is to out-fight and defeat the Axis, a necessary part of winning the Peace is wise and proper planning for the future.

STEEL WILL DO IT BETTER

As creators of the things to come, you design engineers face a grave responsibility. For on the commercial soundness of your thinking ahead will largely depend the postwar prosperity of American business and industry. Your drawing board dreams will have to be eminently practical.

Your product, whatever it is, must first of all fill a real need. And it must be able to meet competition either by its superior quality or by its lower cost.

That is why we remind you not only of steel's outstanding versatility, but of its proved economic superiority.

What other material can be had in so many different forms or with such widely different properties-or can be used in so many different ways for such widely dif-ferent purposes-as steel? Where can you find a material, old or new, that can so readily meet every fabricating requirement?

Steel, and especially the new steels developed during the war, gives you almost unlimited freedom of action both in design and application. Whatever quality your product needs - strength, toughness, light weight, endurance or beauty-steel can provide it. And generally at lower cost.

Let us help you look further into this matter of steel. Our technicians will gladly consult with and advise you.

CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

Columbia Steel Company, San Francisco, Pacific Coast Distributors United States Steel Supply Company, Chicago, Warehouse Distributors United States Steel Export Company, New York

UNITED STATES STEEL

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These Vulcan Heating Units are flexible.

Metal casings of Can be bent to various metals almost- any deto suit the sirable shapes application without damage. Easily shaped Conventional and can be Screw-and-nut grouped to obtain or plastic knob various combinations of wattages terminals optional VULCAN

VULCAN ELECTRIC CO.

Makers of a wide variety of Heating Specialties that use electricity.

And Heating Elements for assembly into the manufacturer's own products.

One OF THE PRODUCTS Jelliff MAKES is fine RESISTANCE WIRE



Carefully-controlled annealing is part of the manufacture of all Jelliff resistance wire

not plain steel, copper, or magnet wire but special resistance wire as fine as 0008 in. dia., drawn by special Jelliff methods to insure uniformity and top quality.

ALLOYS FOR EVERY PURPOSE

ALLOY "A"—Nickel-chromium; nonmagnetic; spec. resistance 650 ohms/ CMF.

ALLOY "C"—High resistance to oxidation and corrosion; for electronics and industrial equipment.

ALLOY "D"—Nominally 30% nickel, 15% chromium, balance iron. Specific resistance 600 ohms/CMF.

ALLOY "45"—Copper-nickel for winding precision resistors. Constant resistance over wide range of temperatures.

KANTHAL—Unavailable for duration; we will be pleased to supply data for your post-war requirements.

OTHER Jelliff PRODUCTS
MESH CLOTH: Woven in a wide variet

WIRE MESH CLOTH: Woven in a wide variety of styles, sizes, metals and alloys.

DPPING BASKETS: Sturdy, heavy-duty construction to meet all dipping-basket requirements. Engineering service on proper selection of metals and alloys.

FABRICATED PARTS: Strainers, filters and other parts fabricated from wire mesh. Complete operations from drawing and weaving to fabricating and assembly done in a Jelliff plant.

Write for our "Wire Data Book"

The C. O. Jelliff Mfg. Corp.

Southport, Conn



Among the Associations (Continued from page 218)

NATIONAL DIRECTORS GUESTS OF ROCHESTER P. A.'s

In view of the fact that the Eighth District Council meeting was scheduled to be held in Rochester, N. Y., on Saturday March 24th, the Purchasing Agents Association of Rochester postponed its regular monthly meeting until Friday March 23rd, and prevailed upon the National Directors to reach Rochester a day earlier so that they might take part in the postponed local meeting. Vice President R. C. Sauer states that the meeting was well worth while for the local men were the recipients of a supply of practical information from ten minute taks made by each of the following:

E. P. Scully, Engineering & Research Corp., Riverdale, Md., "A Review of Pur-

A. W. Zackey, Manganese Steel Forge Co., Philadelphia, Pa., "Commodity Services."

L. A. Clark, Troy Engine & Machine Co., Troy, Pa., "Your National and Local Associations."

Clifton E. Mack, Procurement Division, Treasury Department, Washington, "Standardization in Purchasing."

N. O. Aeby, Johns Manville Corp., New York, "Purchasing for Production."

The local association's nominating committee reported on nominees for association offices and the board of directors for the coming year, which will be voted on at the April meeting.

HOUSTON ASSOCIATION ELECTS NEW OFFICERS

Earl Cobden, Hughes Tool Co., Houston, Tex., has been elected president of the Purchasing Agents Association of Houston, for the coming year. William R. H. Mau, Missouri Pacific R.R., first vice president; W. L. Williams, Wyatt Metal & Boiler Works, second vice president; and S. J. Dodson, Great Southern Life Insurance Co., secretary; J. W. Peddie, Maintenance Engineering Co., treasurer.

WASHINGTON WOMEN'S GROUP APPOINTS COMMITTEES

Forty-five members and guests were present at the February meeting of the Women's Group of the Purchasing Agents Association of Washington at the Gowman Hotel, Seattle. Guest speaker was Major Roscoe C. Torrance of the U. S. M. C., who told the members about war activities in the Pacific. Following Major Torrance's talk, there was a showing of a film on frozen foods. The following committees were appointed by President Edith Johnson:

Membership—Edith Francisco, chairman, Yellow Cab Co.; Jean Collins, Van de Kamp's Holland Dutch Bakeries;

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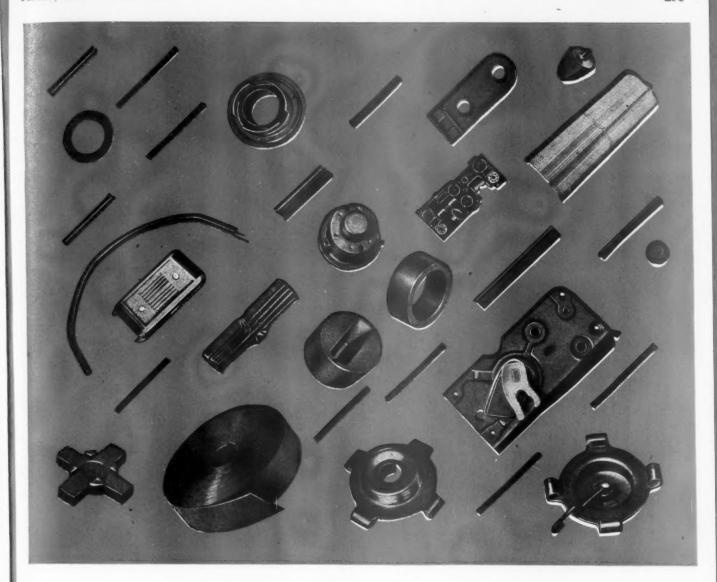
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Not everybody

 F^{Ew} manufacturers possess the versatile production facilities of The Standard Products Company.

Standard is prepared to develop and plan for industry, parts of molded rubber, steel stampings, plastics, in almost any shape or form.

The services of The Standard Products Company Research Laboratory and Engineering Departments are at your disposal. Let us have the necessary data and our engineers will submit designs and proposal.

The Standard Products Company is the world's largest manufacturer of glass run window channel and contour weather strip. Production and replacement channel for passenger cars, truck cabs, busses, motor boats, airplane cabins and streamlined trains is now available for delivery.

Your inquiries are solicited.

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ONLY YESTERDAY...



Shepard Niles CRANE & HOIST CORPORATION

cost, speed production with

the equipment of tomorrow.

Shepard Niles engineers are

available in all war-produc-

tion centers.

462 SCHUYLER AVENUE . MONTOUR FALLS, N.Y

(Continued from page 294)

Eleanor Chisholm, General Insurance Company of America.

Program-Lucille R. Graham, chairman, The Bon Marche; Ann Wahler, unattached; LeNore Wartes, Ketchikan Spruce Mills; Alice Heffernan, Lake Union Dry Docks, and Helene Shultz, Puget Sound Sheet Metal Works.

Reception-Gladys Treisch, chairman, Pascal Co.; Margaret Nyblin, Nord-strom's, and Hazel Dwinell, Sicks' Seattle Brewing & Malting Co.

Publicity-Bernice Wood, chairman, unattached, and Devora Bayer, Sweden Freezer Co.

1 1 1 SURPLUS PROPERTY STANDARDS SECTIONS III, IV, & V

The Surplus Property Board announces that a pamphlet containing Sections III, IV, and V of the Handbook of Standards for Describing Surplus Property is now available at the Superintendent of Documents at a price of 15 cents a copy. These sections cover the following classes of property: Section III, Textile, Leather, and Fiber, Crude, Basic and Finished Products. Section IV, Chemicals, Drugs, Medicines, Oils, Fats, Waxes, Cosmetics, and Household Chemical Preparations. Section V, Glass, Clay, Stone, and other Non-Metallic Mineral, Crude, Basic, and Finished Products.

It was emphasized that this publication is not a list of surplus property that is available for sale. The Handbook of Standards for Describing Surplus Property was undertaken by the War Production Board last year-at the request of the Surplus War Property Administration to establish minimum standards to be used by contractors and Government owning agencies in describing inventories. These standards are designed to furnish sufficient information in commercial terms to allow a surplus property disposal agency to arrange for resale without calling upon the owning agencies for additional items of description.

SECTIONS VI, VIII, AND VIII

The Board also announced that a pamphlet containing Sections VI, VII, and VIII is now available at the Superintendent of Documents at a price of 10 cents a copy. These sections cover the following classes of property: Section VI-Pulp, Paper and Paperboard Products and Products of Printing and Publishing Industries. Section VII-Rubber, Crude, Basic, and Finished Prod--Natural and Synthetic. Section VIII-Petroleum and Coal Crude and Basic Products.

The handbook will consist of 22 sections, ten of which have been issued. Sections I and II, Metals and Metal Basic Products and Wood Basic and Finished Products and Sections XII through XV, Railroad Transportation Equipment; Aircraft and Components; Ships, and Marine Mechanical Equipment; Motor Vehicles, Tractors, and Miscellaneous Transportation Equipment, and Section IX, Industrial and Service Machinery and Equipment, have been published previously.

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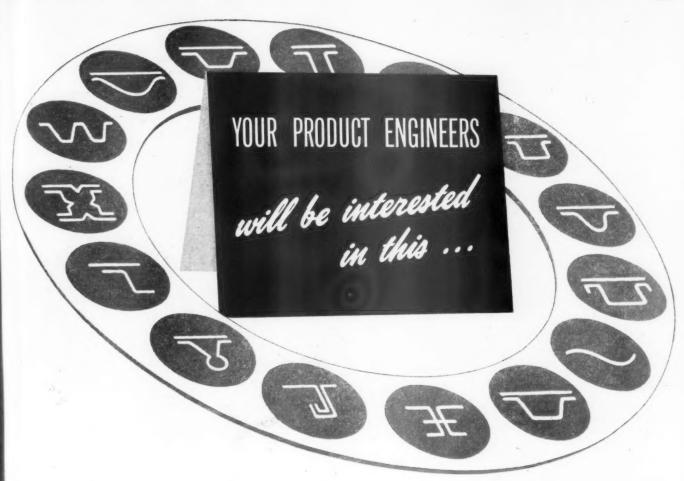
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When your engineers or production men ask for low-alloy high strength steels, you can be sure that Armco 50Y and 55Y will do the job.

Fabricate Readily

For one thing, ARMCO 50Y and 55Y fabricate readily because their high yield strength is obtained by chemistry of the steel rather than by cold rolling. When stiffeners like those shown on this page are utilized for stronger and more efficient construction, these steels are a logical choice for the entire structure.

For some uses, lighter-than-conventional gages of high strength steels can be used without reinforcement of any kind. Besides these structural advantages, Armco Low-Alloy High Strength Steels have excellent welding properties. Corrosion resistance of Armco 50Y and 55Y is considerably greater than that of ordinary steel. Where extra rust resistance is needed, zinc or aluminum coatings can be applied.

Ask For More Data

Write us for complete data on ARMCO Low-Alloy High Strength Steels. It may help your engineers design new or improved products that have less weight and greater efficiency. The American Rolling Mill Company, 1091 Curtis Street, Middletown, Ohio.

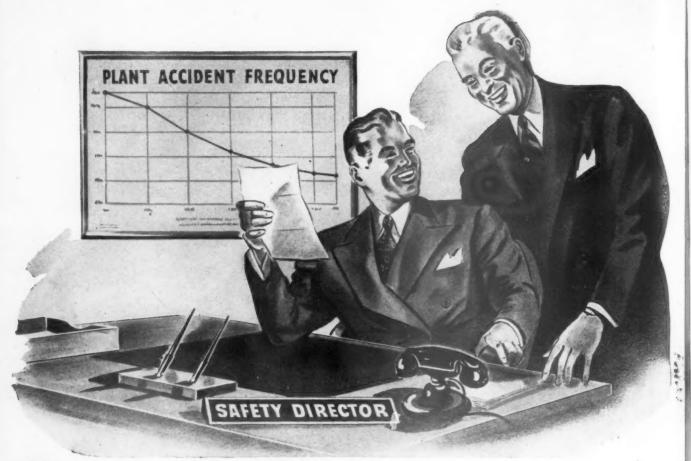
THE AMERICAN ROLLING MILL COMPANY



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The man who likes to have management look over his shoulder

The Safety Director knows his work will be more successful if top management is interested enough to see how his department is saving lives and guarding man hours. Even when the record is not as good as he would like, the safety director knows that correction is easier when management is ready to establish his remedy as plant policy. Where management works closely with safety departments, outstanding safety records are

being achieved. That this practice is on the increase is gratifying to all who are concerned with providing greater safety to America's working men and women.

HY-TEST Safety Shoes

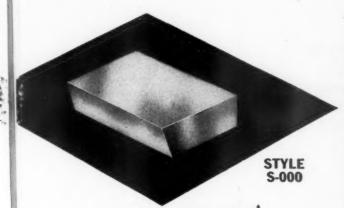
... are available in a number of types for various protective needs. Extra quality, comfort features and maximum protection are the reasons Hy-Test has long been a favorite of safety shoe wearers.



HY-TEST Safety Shoes



New
KENNAMETAL
"Universal"
BLANKS



FACILITATE TOOL MAKING and Keep Stocks Down!

These new Kennametal "Universal" tool blanks are literally "jacks-of-all-trades." Rectangular in shape, with 12° clearance angle formed on one long edge, they can be used to make many different types of tools, simply by setting them into open-end recesses, as illustrated. They are available in all recognized standard sizes, many of which are stocked in several grades.

Their use reduces inventory investment, and simplifies stock room problems. And, above all, they make it easier for you to employ on a widespread, yet economical scale, the advantages of Kennametal—its ability to cut metal, including steel up to 550 Brinell hardness, accurately, at greatly increased speed, with amazing tool life.

Catalog particulars, and prices, are yours for the asking.



10.

ONE STYLE TOOL BLANK FOR ALL THESE JOBS. **STRAIGHT** TURNING TOOLS **TURNING TOOLS** OFFSET TOOLS OFFSET TURNING TOOLS **FACING TOOLS** SQUARE NOSE

(Continued from page 110)

not his firm can manufacture a new product that can be marketed in post-war competition, or placed in a niche of honor in the Smithsonian Institute. He will be faced with the problem of procuring material so that competitive prices can be maintained and have the responsibility of recommending alternate material so that the intended result may be achieved.

The Purchasing Agent will receive his due reward in Heaven.

The foregoing description of the purchasing job, feelingly expressed by one who is carrying that responsibility in a busy manufacturing organization, forms the text of a little folder distributed among department heads and plant executives as a means of fostering greater understanding and cooperation, and consequently making possible better procurement. A note on the front cover reads:

"Dedicated, as an explanation, to the patient and understanding Department Heads, upon whom rests the success and efficiency of the Purchasing Department,"

> Spending and Saving The People's Money

(Continued from page 114)

debt estimated at 300 billions of dollars by 1946, there are but two alternatives for the future—more taxation or more economy in government. These officials feel that economy is difficult without impairment of service or efficiency or both, but they should note that it is possible to save money through increased efficiency in government purchasing. Any necessary increase in the administrative appropriations for the purchasing departments to bring this about, can be offset by the elimination of duplicating functions

(Continued on page 302)

Buy More War Bonds





Fibreen keeps dirt and moisture from the motor of this powerful tractor.



Temporary emergency storage shelters are made with Fibreen on 2"x4" frame.



Steel sheets wrapped with Fibreen are shipped safely in open cars.



Felt hats, wrapped with Fibreen, are protected from dirt and dampness.



Crates made with Fibreen eften replace to.id boxes, with resultant savings in packaging and shipping costs.

Send for a "working" sample of Fibreen. Our knowledge is at your service.

It's the All-Purpose Paper

Felt hats or tractors — sheet steel or hairpins — excess machinery in storage — goods shipped in open cars or in rolls, crates or cases — all are protected from moisture and dirt by Fibreen. Make sure that your products have dependable Fibreen protection — to assure safety while in storage and to prevent losses and complaints due to exposure in transit.

Keep a few rolls of Fibreen in your shipping room. It's pliable and tough!

SISALKRAFT CO.

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205 N. WACKER DRIVE CHICAGO 6.14.

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Manufacturers of SISALKRAFT, FIBREEN, SISAL-)
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EASY ON MEN!

Hand driving screws into garnish molding is slow, hard work. But as long as he used slotted screws, this world-famous manufacturer of automobile bodies didn't dare risk power driving. Driver skids came too high – and too often!



EASY ON THE POCKETBOOK!

A change to Phillips Recessed Head Screws ruled out driver skids... permitted use of power methods. Also eliminated one operation involving countersunk washers. All of which added up to substantial cost-savings!



EASY ON ENGINEERING!

Easy on assemblymen . . . easy on the pocketbook . . . Phillips Screws are kind to design staffs, too. With Phillips, engineers can build product strength and rigidity up to specifications slotted screws just can't approach!



EASY ON THE EYES!

Besides being strength-builders, Phillips Screws are also great little sales-builders. They help dress up any product . . . do away with unsightly burrs that snag clothing and make an otherwise sweet piece of merchandise look sour!





In the Phillips Recess, mechanical principles are so correctly applied that every angle, plane, and dimension contributes fully to screw-driving efficiency.

... It's the exact pitch of the angles that eliminates driver skids.

... It's the engineered design of the 16 planes that makes it easy to apply full turning power – without reaming.

... It's the "just-right" depth of recess that enables Phillips Screw Heads to take heaviest driving pressures.

With such precise engineering, is it any wonder that Phillips Screws speed driving as much as 50% - cut costs correspondingly?

To give workers a chance to do their best, give them faster, easier-driving Phillips Recessed Head Screws. Plan Phillips Screws into your product now.

PHILLIPS Recessed SCREWS

WOOD SCREWS . MACHINE SCREWS . SELF-TAPPING SCREWS . STOVE BOLTS

Made in all sizes, types and head styles
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American Serew Co., Providence, R. I.
Atlantic Serew Works, Hartford, Conn.
The Bristol Co., Waterbury, Conn.
Central Serew Co., Chicago, III.
Chandler Products Corp., Cleveland, Ohlo
Continental Serew Co., New Bedford, Mass.
The Gorbin Serew Corp., New Britain, Conn.
General Serew Mfg. Co., Chicago, III.

The H. M. Harper Co., Chicago, III.
International Screw Co., Detroit, Mich.
The Lamson & Sessions Co., Cleveland, Ohio
Manufacturers Screw Products, Chicago, III.
Milford Rivet and Machine Co., Milford, Conn.
The Rational Screw & Mfg. Co., Cleveland, Ohio
New England Screw Co., Keene, N. H.
Parker-Kalon Corp., New York, N. Y.
Pawtucket Screw Co., Pawtucket, R. I.

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Pheell Manufacturing Co., Chicago, III.
Reading Screw Co., Norristown, Pa.
Russell Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Scovill Manufacturing Co., Waterville, Conn.
Shakeproof Inc., Chicago, III.
The Southington Hardware Mfg. Co., Southington, Conn.
The Steel Company of Canada Ltd., Hamilton, Canada
Wolverine Bolt Co., Detroit, Mich.

Mr. P. A.

If you have metal cutting jobs here is our message for you





Spending and Saving the Peoples' Money

(Continued from page 300)

in other government agencies. But to accomplish these results there must be complete independence of governmental purchasing from political and other pressure groups, and complete cooperation of the agencies to be serviced.

Judging from experience, it is possible to predict a saving of at least twenty-five dollars for every administrative dollar spent to maintain an efficient purchasing department. The rate of return proves the soundness of the investment. This fact must be brought home to the taxpayers for, after all, they will determine the future of centralized standardization and purchase for their government.

The Personal Factor

Perfection of planning can be nullified at a single stroke by improper appointments in policy-making positions, which places the responsibility squarely up to the tax-payers. Experienced executives will be available for appointment in the post-war era, and efficient organizations can function under their direction. Tomorrow's purchasing agents should qualify before appointment. They should not be educated at the expense of their sponsors, except as they win their way to promotions through training and experience. The best of today's planning and procedures, with the experience gained in procurement at the most trying time in the world's history, will become the groundwork for future progress.

Appointees must be honorable men and women, with the will to function and the courage to carry out their statutory duties in the face of opposition. The day of "easy money" will be over. They must form the front line of defense against raids on the public treasury and the infiltration of maladministration in government purchasing. They must win public confidence for their work through their accomplishments, and cooperation through their tolerance.

Today loosely drawn statutes and broad discretionary powers transferred from the Congress and the Legislatures to the administrative officers of government invite abuse. Every public buyer, entrusted with the wise expenditure of large sums of the public moneys, has a continuing responsibility to the taxpayers whom he serves. He must take to

(Continued on page 304)

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RADIOPHONE



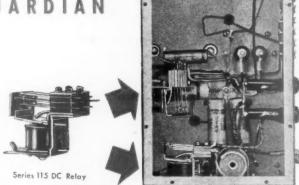
for Automatic Control of Electrical Circuits...

THERE'S A Relay BY GUARDIAN

In this application one Guardian relay in its normal position feeds the input of the Vibrapack for receiving purposes. On the changeover from receiving to transmitting it disconnects the Vibrapack and simultaneously energizes the other relay. This in turn connects the Dynamotor input and output circuits.

Both relays are Guardian Series 115 with double wound coils for operation on 6 or 12 volts D.C. with the 6 volt winding in parallel and the 12 volt winding in series. It is a small, compact relay, ideal for use where space is limited.

Its use in Marine Radiotelephone is but one illustration of the many applications of relays in radio and electronic equipment. For complete description of numerous types of Relays by Guardian, write for Guardian's new Catalog No. 10.



Hallicrafters HT-11 Radiophone

Unit Showing DC Power Supply



ELECTRIC

CHICAGO 12, ILLINOIS

A COMPLETE LINE OF RELAYS SERVING AMERICAN WAR INDUSTRY

Tecombridated Mission



It was determined during one of our large naval engagements shortly after Pearl Harbor, that 60 to 65 percent of the casualties among our men were due to flash burns from the explosion of enemy shells and bombs . . . The Naval Medical Research Institute was assigned the problem of developing a means of protecting the men in our fleet from this hazard.

Because of West's intimate knowledge in the manufacture of protective ointments designed to safeguard workers from the hazards of industry, we were called in by the Naval Medical Research Institute to cooperate with them in this problem... We take pride in our part in the development of a cream which was adopted by the Navy and which we have been supplying, for combat duty, ever since. This cream can be easily applied, dries in a thin film on the skin, withstands perspiration and exposure, does not hamper the effectiveness of those who use it, and what is most important, gives full protection from flashes of extremely high temperature.

It was said, upon the completion of the laboratory confirmation, that this cream would do much to keep men at guns who otherwise would be out of action due to serious and painful burns... The Army has also adopted this protective cream for the prevention of flash burns in certain services where the exposure to this hazard was great... We are proud that the armed services have said to us: "Well done."

Our entire production facilities for making this cream are now taken up in supplying the growing needs of the services . . . When peace comes, the protective cream for the prevention of flash burns will play an important role in protecting welders, blast furnace operators, firemen and other industrial workers against similar occupational hazards.



Manufacturers of Products to Help Prevent Industrial Dermatitis



Spending and Saving the People's Money

(Continued from page 302)

heart the warning of Grover Cleveland:

"When more of the people's sustenance is exacted through taxation than is needed for the economical administration of the government, such taxation becomes ruthless extortion, and is a violation of the fundamental principles of a free government."

Inventory Control in the Navy

(Continued from page 99)

ing made effective. This group, under the Inventory Control Officer. makes certain that there is a responsible desk for the records concerning each item. This is essential so that when the reports from the field come to the Bureaus they will be handled in a uniform manner and that the desk which has the responsibility for procurement will have available the inventory of that item from all depots and stations in which it is stocked. This Bureau Inventory Control also requires that there shall be a review of every purchase to indicate that there has been an analysis of the requirements, the inventory and the schedules of delivery so that the procurement of the item is justified.

Each type of material requires a different procedure. For the 80,000 items of General Stores the Navy has a Quarterly Replenishment system. Under this system each station reports the quantity on hand of these items, the amounts they have issued in the past 3 months, their estimate of the amounts to be required over the next 12 months, and the quantities on order. This immediately indicates whether that station has an excess or a deficiency and in the Bureau of Supplies and Accounts these pluses and minuses are balanced: if there is an excess, the material is redistributed; if there is a deficiency, contracts are issued procuring the material necessary for the next 12 months requirements. Similar systems are being inaugurated for other types of material so that ultimately there will be a central control for every item of material purchased in the Navy

One of the greatest difficulties which the Navy has faced is that of identification of items of a technical

(Continued on page 307)

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Designed, built and erected by Byrne Doors, Inc., Detroit. Apac Sheathing installed by the Faulkner Construction Company. (Official U. S. Navy photograph.)

... and SAFE because it's sheathed with "Century" APAC

HE striking architecture of this Navy Blimp hangar is its own tribute! The doors are like skyscrapers...120 feet high . . . 220 feet wide . . . weighing 300 tons. And they must open the entire width of the hangar in TWO MINUTES.

These giant portals must be the masters of wind and weatherfor failure to open and close quickly might spell the doom of a wind-tossed Blimp. So they are completely sheathed with "Century" Apac-K&M's low cost asbestos-cement sheet material. It is rot-proof, rust-proof and fire-resistant.

> In thousands of industrial plants, K&M "Century" Apac is used for roofing and siding, office paneling, sheathing in machine shops and stock rooms, linings for elevator casings and shower stalls. It is ideal for new construction, repairs or plant additions.

Enormous quantities of "Century" Apac have gone into wartime jobs. YET NOW THERE'S PLENTY AVAILABLE FOR YOUR INDUSTRIAL CONSTRUC-TION WORK ... without delay, without restrictions.

Check these "Century APAC advantages for construction and renovation work 1. Made of Asbestos Fibre and Portland Cement 2. Pleasing light gray color 3. Fire resistant and durable 4. Convenient size—4'x8', 4'x9'
and 4' x 10'. (Three thicknesses—3/s'', 1/4" and 3/6".) 5. Low cost 6. Rat and termite proof 7. Easy to cut, handle and apply 8. Fastens with nails or screws 9. Practically no maintenance required 10. Prompt delivery

Nature made Askestos

Keasbey & Mattison have been making it serve mankind since 1873... with products like "Century" Apac, "Century" Asbestos Corrugated and Flat Lumber, Ebonized Asbestos, High Temperature Insulations and others. Interested in modern Asbestos and Magnesia materials? Write!



COMPANY · AMBLER · PENNSYLVANIA



Hydraulic presses, furnace doors, manipulators, soaking pit covers, shears, ingot strippers and other vital equipment in hundreds of mills and metal working plants the world over are controlled by HOMESTEAD PROTECTED-SEAT HYDRAULIC OPERATING VALVES.

Fast, accurate, dependable control and smooth operation, is assured by the exclusive HOMESTEAD PRO-TECTED-SEAT, a built-in feature of every HOME-STEAD HYDRAULIC OPERATING VALVE. It consists of a very closely fitted sleeve and inside plunger which reduce fluid flow to a low velocity trickle when seat and disc are still widely separated. Thus any possibility of "wire drawing" or cutting of the seat, resulting in leakage and piston "slip" is eliminated. Maintenance costs are extremely low; from 12 to 18 months continuous service without even so much as the replacement of a small fibre disc, is not at all unusual.

HOMESTEAD PROTECTED-SEAT HYDRAULIC OPERATING VALVES are made in straight-way, 3-way, 4-way or multiple poppet types; sizes 1/2" to 4"; hand operated or remote control, for pressures

to 3000 pounds. Write for details and Valve Reference Book No 38.



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Inventory Control In the Navy

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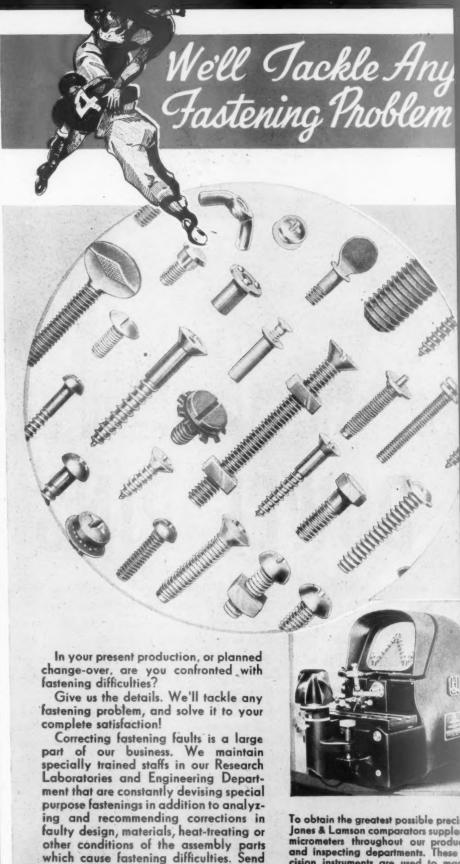
nature. This is particularly true in connection with the parts needed for repair of the machinery and the variety of highly technical equipment which is necessary for operation of the Navy. Such identification is not only necessary in order to determine where that part or that assembly can be used but to determine to what extent there is interchangeability within the parts so as to avoid carrying the same items under different stock numbers. In one depot it was found that by study of interchangeability the number of different items fell from 140,000 to less than 80,000 and within that 80,-000, only some 13,000 had been issued more than 3 times inside the past 6 months.

Identification of Items

The usage factor has been a subject of continual study and search in the various areas in which the Department procures, and the importance of it is illustrated by an example from a report on automotive equipment. Information received from the field on the basis of 21/2 years operating experience indicates that the number of different spare parts called for to maintain construction and automotive equipment is only 11% of the 47,000 parts stocked at advance base depots. This confirms in general the Central Spare Parts Warehouse reports and suggests that if only parts actually needed were stocked, the burden of distribution would be much lighter than currently supposed.

From a study of the storage and stocking problem it became obvious that there was a necessity for a common identification numbering system and a further need that there should be a catalog in which all of the various items could be listed and identified. The necessity for a single numbering system has been demonstrated to the Navy by the difficulties which have been experienced in the advanced bases of obtaining materials where there is a wide variety of manufacturers' numbers, various catalogs and reference tables, none of which have been prepared on any common principle. The result is that at a Base the exact item which may be needed may be available under an entirely different name and number but for all intents and purposes it does not exist and has to be ordered from the Continental supply system. This work within the Navy

(Continued on page 308)



To obtain the greatest possible precis Jones & Lamson comparators supplen micrometers throughout our product and inspecting departments. These cision instruments are used to mag thread form, tools and special prod 100 times actual size . . . to make a tours, diameters and angles of screw bolt heads exact to specifications.

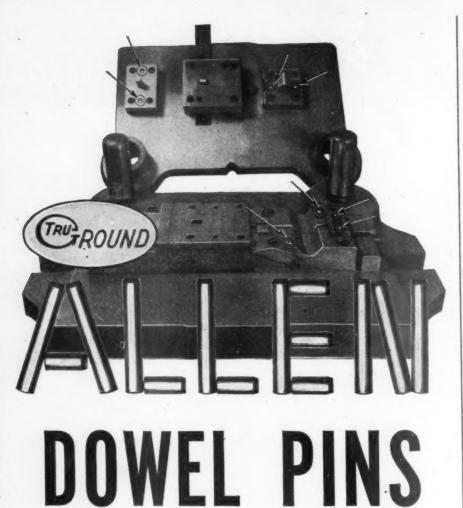
All fastenings furnished with HOLTITE-Phillips Recessed Head or Slotted Hea

us complete information about the

problems confronting you. We will recommend the most efficient solution.



In



They serve as locating pins for the die-maker's work — and then go on to general duty as pins and pivots in various machine assemblies.

By their accuracy and strength they retain precision standards in tool and die and machine assemblies under punishing stresses.

They are ground to a limit of .0002" over basic size, with an allowable tolerance of plus or minus .0001". Surfaces are finely polished; subsequently treated with a rust-preventive.

Metallurgically in a class with ALLEN Hex-socket Screws: — made of the same special-analysis ALLENOY steel, heat-treated to an extremely hard surface, with a core of the right toughness to prevent "mushrooming" when driven into a tight hole. . . Tensile strength, 240,000 to 250,000 lbs. per sq. inch. Typically the Allen high safety-factor in HOLDING-POWER.

Ask your local ALLEN Distributor for samples and dimensional data... the same Distributor who serves you dependably with Allen Hex-socket Screws and other "life-lines" of essential supplies.





THE ALLEN MANUFACTURING COMPANY
HARTFORD 1, CONNECTICUT, U. S. A.

Inventory Control in the Navy

(Continued from page 307)

on numbering and cataloging is being studied and progress is being made but it is a long-range problem which has not yet been completed.

Surplus Disposal

The final phase of Inventory Control is the disposal of excess and surplus material. This requires a determination: first, of what is excess locally; second, whether it can be used anywhere else in the supply system; and, lastly, that it be scrapped or sold. It is the responsibility of each station, under the rules laid down by the central authority, to determine what materials are in excess. The Navy requires that these excesses be listed monthly and a catalog is prepared and distributed to the other Naval activities so that the needs of other stations and depots may be met from supplies already available within the Navy. This, of course, is the most economical procedure and millions of dollars worth of Navy material is redistributed on this basis each month.

The Material Bureaus then determine whether the balance must be saved for some emergency such as repairs to battle damage, and this is retained in the depots. The balance is turned over to the Disposal Agencies which are set up by Congress to finally sell for consumption by the public all surplus material.

Conclusions

An effective Inventory Control requires:

- (a) A central organization with authority to issue policies and directives.
- (b) An Inventory Control Group within each Naval activity which will implement the policies and directives within that part of the organization.
- (c) A complete, accurate and perpetual inventory.
- (d) The justification of procurement based on the amounts on hand and on order balanced against requirements.
- (e) An auditing group that will check to see that the procedures within the subordinate sections are carrying out the directives efficiently.
- (f) Proper nomenclature and numbering systems so that materials may be properly identified.
- (g) A system of locating and eliminating excess and surplus materials.

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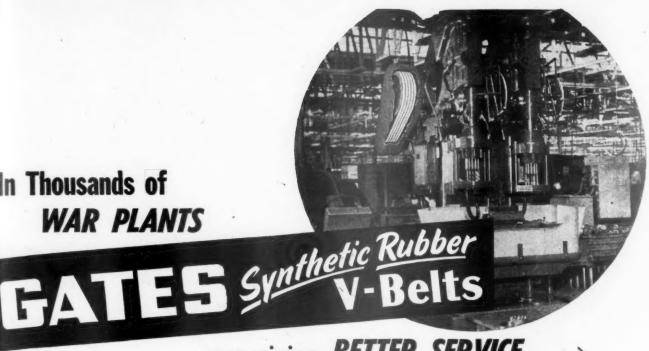
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nd at In Thousands of WAR PLANTS



- are giving **BETTER SERVICE** Than Any V-Belts Ever Made of NATURAL RUBBER!

To meet the unprecedented severity of combat service on U. S. Army tanks, tractors and self-propelled big guns, Gates has developed and built synthetic rubber V-belts to far higher service standards than were ever required of pre-war, natural rubber V-belts!

> The importance of this fact to industrial V-belt users is this: Every improvement developed by Gates for these Army V-belts has also been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered

In the case of many other products, you must wait until after the war to get the benefit of war-time improvements. But victory depends upon production-and production depends upon V-belts which drive the producing machines. That is why Gates has been able to pass on to you immediately, in your Standard Gates Vulco Ropes, every V-belt improvement which Gates specialized research has developed for use in the Army's motorized equipment.

In addition, where V-belts of special construction are required your Gates Rubber Engineer can supply a Gates V-belt that is precisely engineered to meet your special needs. Whenever you have a drive problem or a V-belt problem, just pick up your telephone directory and look under the heading "Gates Rubber." The Gates Rubber Engineer will bring right into your plant the full benefits of every advance in V-belt construction that Gates specialized research has developed.

THE GATES RUBBER COMPANY

Engineering Offices and Jobber Stocks in All Large Industrial Centers

and one of these 5 GATES V-belts will meet any Special need you may have.

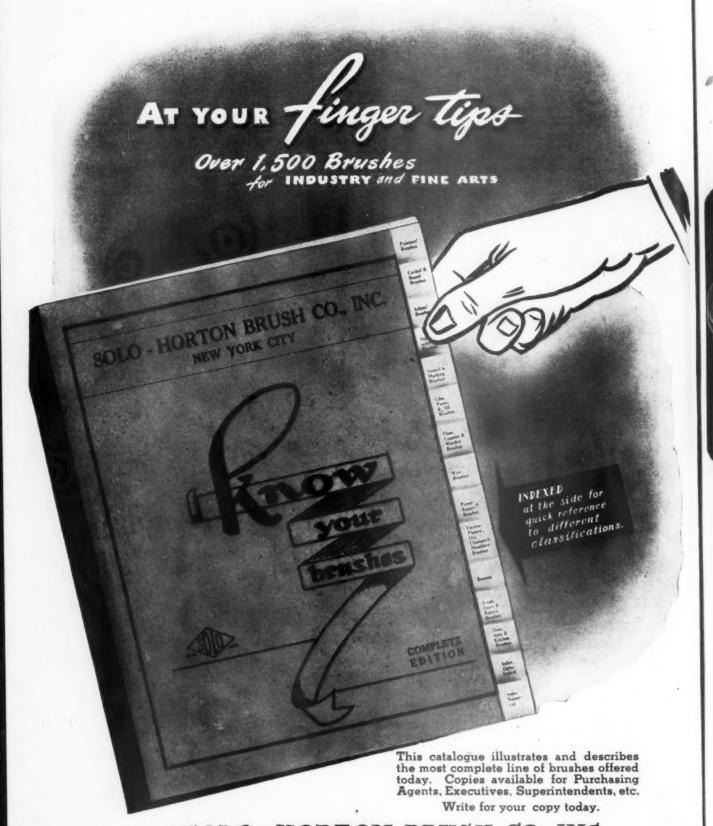
Rayon Cord **V-Belts** Static-Safety **V-Belts** Special Synthetic **V-Belts Cotton Cord V-Belts** Steel Cable **V-Belts**



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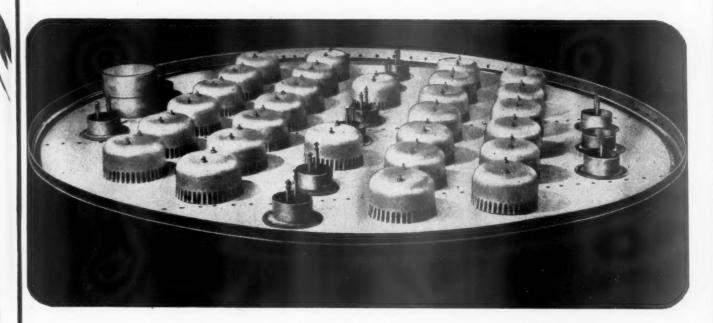
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AT LOW COST!



• Whether it's used for trays, bubble caps and chimneys for fume absorption columns—as illustrated above—or for countless other applications in all types of industries, you can depend upon Republic ENDURO Stainless Steel to do the job efficiently and at low cost.

This time-proved stainless steel offers many advantages. It resists the attack of rust and corrosion. It resists most acids, compounds and gases, hot or cold. It will not contaminate most chemical solutions. It is easy to clean. It

is tough and strong—has good creep strength. It resists scaling at high temperatures, too and thus is well suited for furnace parts.

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For strength and simplicity, only two parts are used - bearing bars which carry the load and have curved slots punched ABOVE THE NEUTRAL AXIS, and cross bars, of the same cross sectional area as the slot itself, pressed into these slots to distribute the load. No rivets, bolts or welds are required, thus eliminating the possibility of loose joints. Tri-Lok flooring comes in rectangular, diagonal

and U shapes with Safety Steps — ask for Bulletin 1140 — Dravo Corporation, National Department, 300 Penn Avenue, Pittsburgh (22), Pa. (Distributor for THE TRI-LOK COMPANY)





Wherever men must work under damp or wet condibrand slickers, jackets, pants and hats. Moisture resisting or fully water-proofed, as the need demands, Frog. Brand Protective Work Clothing defies dampness, guards health, provides comfort.

THE H. M. SAWYER & SON CO. EAST CAMBRIDGE, MASS.

Training for Contract Termination and Settlement

(Continued from page 101)

to a maximum of fifty persons that there is more freedom of discussion. Second pitfall to avoid is long-winded lectures. The contractor should learn by doing. Such a type of course is now in use and teams are being trained throughout the country and will be available to contractors through the subcommittees on Training.

The Purchasing Agent's Part

The purchasing department has an important part in the termination procedure. This is the department that acquired the inventory, it is familiar with priorities and allot-ments, knows markets, prices and storage problems. Certainly the purchasing agent will consult with the production engineer in determining what inventories will be retained for continuing production and he will seek help from the sales department in locating a market for inventory to be sold, but the main problems of termination and the training of personnel, both in his own organization and in suppliers organizations, might well all be handled by the purchasing department.

Purchasing agents may well remember that contract termination can be considered procurement in reverse. A high degree of cooperation with the sales department in determining markets for surplus goods will materially assist in plant clearance. Cooperation with the inventory and productoin control departments in holding inventories to a minimum can also be of assistance. They may also help by informing suppliers of parts and materials just what requirements must be met if a supplier is to have his claim for settlement promptly handled. A survey of suppliers could determine whether the supplier is in a position to properly file his claim with speed and finality.

It must be remembered that ordinarily the government does not deal with subcontractors and the burden of settling subcontractors' claims rests on the shoulders of the prime contractor; therefore, any training or planning which is done in advance of a contract termination can serve to make the burden that much lighter. Purchasing agents can give valuable assistance in promoting attendance of contractors and suppliers at training courses. The Subcommittee on Training in your area will welcome your help and support in their efforts.

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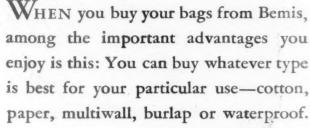
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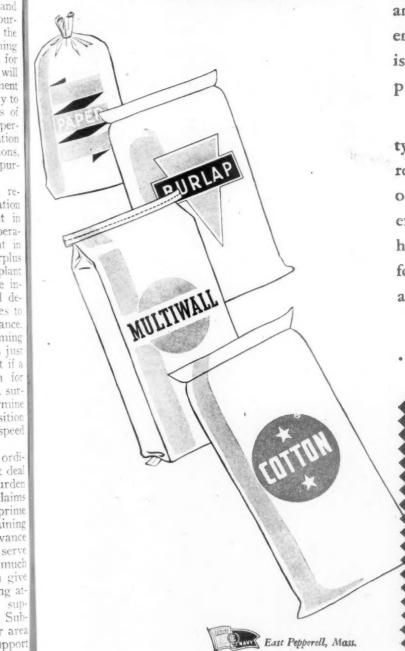
Whatever's the BEST BAG FOR YOUR USE

we make it!

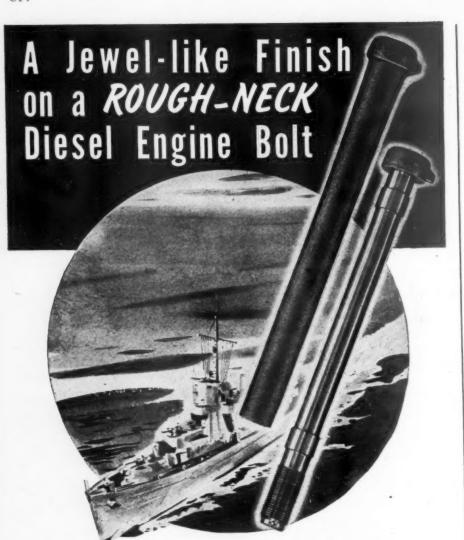


Bemis is a leading producer of all types of bags and consequently has no reason to high-pressure you toward any one type. We have no favorites. If our experienced packaging specialists can help you to determine which is the best for your use, you may be sure that their analysis and advice will be unbiased.

Whatever's the best bag for your use ... we make it.



BEMIS BAGS BEMIS BRO. BAG CO. BETTER BAGS SINCE 1858



Whatever YOUR unusual precision parts job, Western offers you the ingenuity and skill to do it ... on a quantity production basis

There can't be any fooling around when it comes to parts like these connecting rod bolts that go into Cooper-Bessemer 600 and 850 h.p. diesels that furnish propulsion and auxiliary power to Uncle Sam's naval units. Over 15" long, with 11/2' body diameter, these husky bolts are turned and ground from rough forgings of heat-treated alloy steel. Five separate grinding operations give them a jewel-like finish, free of tool marks. Specifications include class 3 ground threads and piece-bypiece Magnaflux inspection to make sure there are no hidden defects. Western produces them, fast and flawless - a good tip on where to get your unusual precision parts jobs done. It pays you to send us your inquiry.

Western Complete Service - Special precision screw machine products to specifications. Capacity range, 1/6" to 45%" round. Complete equipment for all types of secondary and processing operations precision grinding, heat-treating, hardening, pentrating.



High Finance in the Admiralty Islands

(Continued from page 84)

dollar, paid \$2.50 each for all they could buy. When the finance officer learned the reason for the drain on his supply of silver dollars, he investigated, stopped the public saleand made a private deal himself with the Australians.

About the only thing it is possible to buy in the South Pacific is an occasional beer, candy, toilet articles, tobacco, and a few other articles, all sold very cheap by the Army and Navy stores. As a result, most of the men have lots of money left and will overbid each other for war mementoes. The Army and Navy frown on the unauthorized manufacture and trade, and in the case of outright racketeering or the sale of service material, will mete out stiff penalties.

Also there is a loss of perspective when you come upon some object out of the ordinary, even though sound judgment tells you it has little value. A little white penny marble changed hands three times on a representation that it was a pearl-and at prices ranging from \$50 to \$200.

So business goes merrily on among the islands of the South Pacific. Even though the price seems to be ridiculous in relation to the value received, few men ever complain. They shrug their shoulders and resell the item at a profit to their equally credulous buddy.

When You Buy **Plastics**

(Continued from page 95)

tolerance limit specified. Extra labor is involved in gauging the parts and of course the customer pays for the gauge and for the gauging operations and for the rejections. customer can have exact close tolerance provided he is willing to pay for it by costly inspection and rejects. Almost any tolerance can be hit on the nose if enough pieces are inspected and thrown away.

The first thing that the Purchasing Agent should do is to make sure that the close tolerances specified by the requisitioning department are really necessary, on any plastics procurement job that passes over his desk, for there are important considerations other than close inspections and rejections. If it is absolutely essential to have tolerances closer

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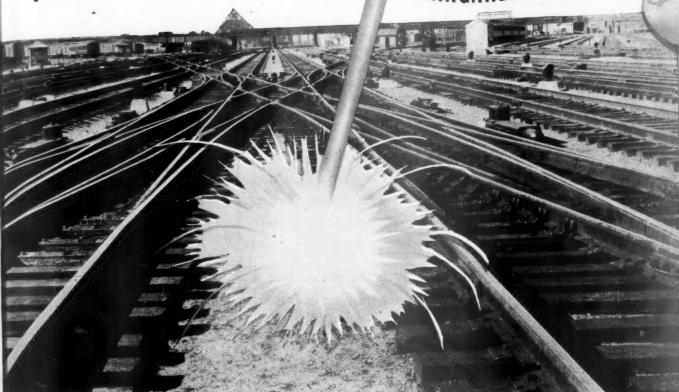
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a new specialized
WELDING ELECTRODE

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Now you can have a *better* welding electrode . . . one hat *lasts longer* and is *easier to apply* . . . for building p or otherwise welding high carbon and/or high manganese steels!

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uteoser McKAY E-973 is specially made for the job. The veld metal will not cross check or crack under the eposit. Although soft in the "as welded" state, it work hardens rapidly... permitting heavy pads to be wilt up without danger of mushing down, cracking bose, spalling or flaking when subjected to constant

wear and service. Exceptionally smooth flowing properties make it unusually easy to apply. It does not require pre-heating or frequent delay for peening.

McKAY E-973 is the result of intensive research and service testing. It was specially developed for railway use but has wide application in other industries where welding of comparable steel is involved . . . effective demonstration of the McKAY policy of manufacturing electrodes to meet specific needs.

Write today for full information.

GENERAL SALES OFFICES: YORK, PA.



THE TELESTICOMPANY PITTS BURGH, PA.

WELDING ELECTRODES . . . COMMERCIAL CHAINS . . . TIRE CHAINS



(Continued from page 314)

than .003 inch it may be necessary to introduce some other quality in the material or change the design. Also, fine tolerances may have a bearing on the type of material that is to be used; furthermore, it may be necessary to sacrifice some particular platic quality that may have been desired.

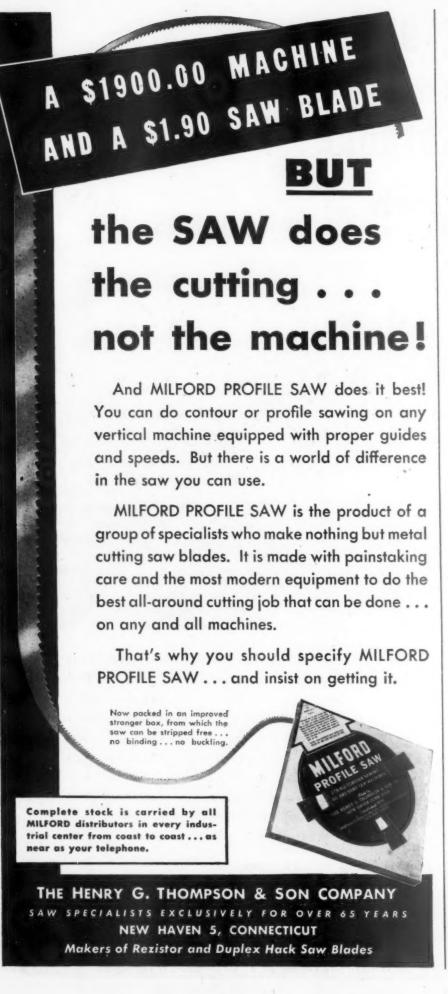
So, make certain when close tolerances are indicated, that they are indispensable. The Purchasing Agent may find that in housings for certain equipment, cases, structural parts. cabinets, containers, handles and many other items, the fine tolerance indicated on blueprint specifications is unnecessary and that it makes no difference from a use and merchandising standpoint whether a unit is molded with a tolerance of as much as .01 inch or even more where the factor of precision is of no conse-Easy tolerances make for easy molding, minimum rejects and low unit costs.

Another important factor is scheduling. It too offers the way for savings when buying molded plastics. Purchasing Agents are now well grounded in the factor of lead time and scheduling deliveries to adequately anticipate manufacturing requirements. Molders receive requests for quotations on 10,000 and 50,000 piece jobs and larger that ask for quick delivery. A molder can build a mold and deliver the products within six months, Mr. Groos points out, or he can build a multiple cavity mold and produce the amount required within six weeks if necessary. But, multiple cavity molds are costly. If delivery can be spread over a period of time, the buyer can make big savings in mold costs depending upon the size and design, and the molding procedure that can be used. The best policy is to schedule deliveries according to assembly line needs for a given period, plus a reasonable safety factor.

Analysis of Bids

Here's another factor that requires careful analysis, namely the matter of bids. A Purchasing Agent may receive quotations for a job from half a dozen molders. As a rule he will have no basis of comparison to analyze quotations. All he gets is a batch of figures plus mold and unit costs. He notices a terrific difference in some of the quotations. This means that he

(Continued on page 320)



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HEAVY HEXAGONAL

RING NUT

Maintenance time reduced to a minimum

Every day, Powell Valves are piling up records for continuous operation without requiring maintenance. And when they finally need attention, Powell design and construction is such that the time spent SCREWED REPACK UNDER PRESSURE COLLAR
AND SEAT AMPLE SPACE BETWEEN END OF PIPE AND SEAT RALL AND SOCKET TAPER WEDGE

Fig. 500 BRONZE "U. S." GATE VALVE

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115 a in maintenance is reduced to a minimum. The gate valves shown here are examples of the complete Powell Line in which ease of maintenance is always a feature. GROUND JOINT UNION CONNECTION REPACK UNDER AND SEAT . REGRINDABLE. RENEWABLE SEAT RING AMPLE SPACE POWELL BETWEEN END OF PIPE AND SEAT BALL AND SOCKET TAPER WEDGE DOUBLE DISC

Fig. 1375 BRONZE "WHITE STAR" GATE VALVE

In all installations where pressure drop is undesirable and throttling is unnecessary, the gate type of valve, with its full straightway flow area through the body, should be used.

Fig. 500 is Powell's answer to the widespread demand for a sturdy small bronze gate valve where initial cost is a consideration. With its readily removable screwed-in bonnet it is easy to reface the seats and disc or replace the disc if necessary. The taper wedge double disc, with its Powell-designed ball and socket action, readily adjusts itself to any inclination of the seat faces caused by refacing, thus effecting a tight closure. Since the seats are cast integral with the body, this valve will give dependable service as long as sufficient metal remains in the seats to permit refacing.

For extra long life, Fig. 1375 is recommended. The ground joint union connection makes it especially easy to remove the bonnet assembly from the body to reface or, if necessary, to replace the disc and renewable seats. This may be done any number of times without any distortion of the body neck, such as might occur with a screwed-in bonnet. Both disc and seats are made from a special hard nickel-bronze alloy which esists wear over a long period of time. When these parts will not take further refacing, they can be readily replaced with new ones, thus greatly prolonging the life of this valve.

All Powell Valves that require repacking are provided with a specially machined cut-off to permit repacking under pressure when wide open.



The Wm. Powell Co. Dependable Valves Since 1846 Cincinnati 22, Ohio

APRIL, 1

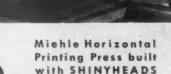


touch ...

IUST as chromium plate gives a finishing touch, or sparkle, to a motor car, so do the shiny heads of these Ferry Cap fasteners give a finishing touch to this modern Miehle Horizontal Printing Press.

Of sturdy character, SHINYHEADS aid, too, in creating that great impressional strength for which this printing press is well known.

These nationally known cap screws are manufactured in High Carbon, C-1038 Steel to



PIONEERS AND

RECOGNIZED SPECIALISTS,

COLD UPSET

SCREW PRODUCTS

SINCE 1907

standards for Full Finished Hexagon Hand Cap Screws, that is-heads completely machined, top and bottom. They have clean-cut, mirror finish hexagon faces and smooth, bright finished body. The threads are uniform and accurate to close tolerance dimensions for class 3 fit. The point is completely machine turned, flat and chamfered.

When ordering Full Finished, Hexagon

Head Cap Screws from your distributor- Tusist upon SHINYHEADS

2165 SCRANTON ROAD

CAP AND SET SCREWS . CONNECTING ROD BOLTS . MAIN BEARING BOLTS . SPRING BOLTS AND SHACKLE BOLTS . HARDENED AND GROUND BOLTS . SPECIAL ALLOY STEEL SCREWS . VALVE TAPPET ADJUSTING SCREWS . AIRCRAFT ENGINE STUDS . ALLOY STEEL AND COMMERCIAL STUDS . FERRY PATENTED ACORN NUTS

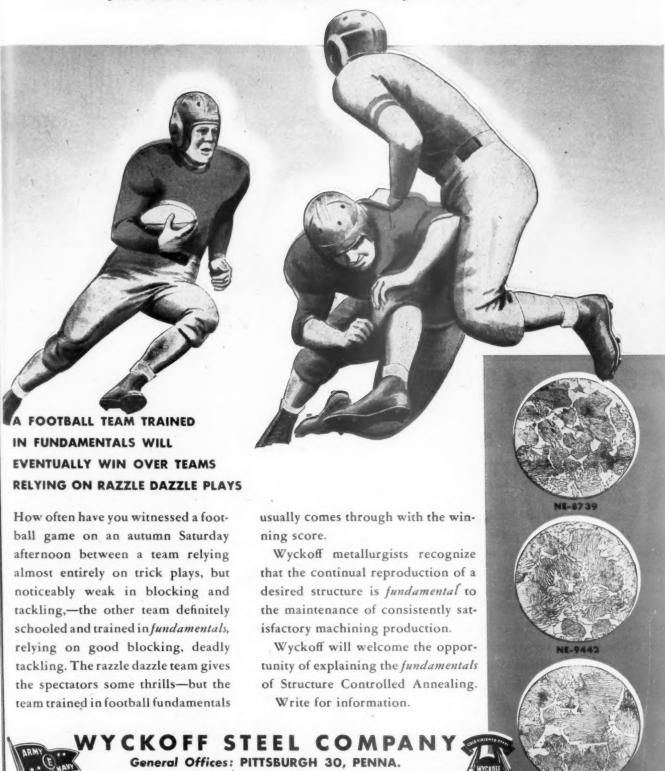
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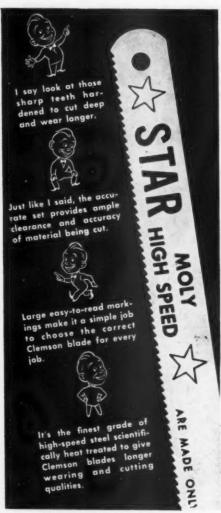
MAINTENANCE OF STRUCTURE IS FUNDAMENTAL IN MACHINABILITY....



orks: AMBRIDGE, PENNA.; CHICAGO, ILL.; NEWARK, N. J.; PUTNAM, CONN.

Manufacturers of Carbon and Alloy Steels . . . Turned and Polished Shafting . . . Turned and Ground Shafting . . . Wide Flats up to 12" x 2" . . . Complete Annealing and Heat Treating Facilities.

APRIL



A BLADE PLUS!



READ ALL ABOUT IT

in Metal Cutting. It's a handy pocket size

booklet on the art of metal sawing, covering the important points in the selection, use and care of hand and power hack saw blades, and the proper use of the sensational STAR Hack Saw Frame. Copies are available for distribution. And they are free to you.

CLEMSON BROS., Inc. Middletown, N. Y.

When You Buy Plastics

(Continued from page 316)

should be familiar with the facilities and practices of the suppliers that he is working with in order to make sure that he is getting the best unit cost for his product, made of materials best suited for its end use. He should be able to determine whether the price being quoted is for a completely finished product as per the blueprint specifications or whether it merely covers delivery of a molded part. Blueprints may indicate tapping or other machine operations on the molded parts. The Purchasing Agent should check to make sure that bids he receives are for the same number of finishing operations and that the quotations cover the job completely.

A Place to Save

Take the matter of polishing parts. There are many parts, which because they are inside an assembly, do not require polishing. Yet without specific information some molders may include a polishing operation which may throw their price out of line or which the buyer does not need on a completed job. Molders should know how a job is to be used and having full knowledge they will be able to quote more intelligently and more accurately.

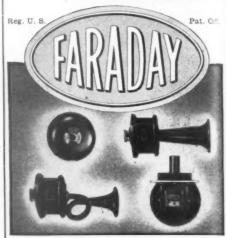
Mr. Groos pointed out the advisability of having the molder do tapping and machining that may be necessary because the molder is familiar with the working of the material and the technique and types of tools that will do the best job.

To Avoid Rejections

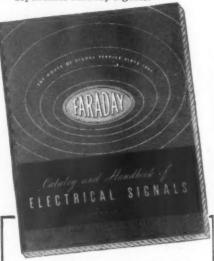
Manufacturers should not accept too literally, he said, the common opinion that the same tooling operations can be used on plastics that are used in machining brass. Many costly pieces have been ruined because shopmen do not have an intimate acquaintance with the techniques that assure a satisfactory. plastics job. Cutting and grooving, for instance, are simple operations if cutting tools are kept well sharpened, if they are of the proper shape and if mechanics know how to avoid binding, overheating and chattering. Otherwise there is likely to be a batch of rejections due to rough spots, chipped edges and chatter marks. Experience has shown that diamond tools and the carbide tools are the best for working plastics. Diamond tools do not generate very much heat which is an important

(Continued on page 322)

For all that's best in AUDIBLE ELECTRIC SIGNALS the name is ...



Faraday Signals represent the peak of modern achievement in electric horns, bells, buzzers, chimes, sirens, fire alarm systems, and clock systems. There is a Faraday Signal for every industrial and institutional need. Save time, save money, save maintenance costs by using dependable Faraday Signals.



Send for this new 104-page

FREE CATALOG

of the complete Faraday line AN INVALUABLE HANDBOOK OF MODERN SIGNAL PRACTICE

FARADA

ELECTRIC CORPORATION

A consolidation of Schwarze Electric Co. and Stanley & Patterson

11 S. La Salle St., Chicago 3, Ill. In Canada: Burlec Limited, Toronto 13

Branches in Principal Cities

1256

Get Better Acquainted with MO-MAX

THEY'RE

"LMW" ALLEGHENY LUDLUM STEEL CORPORATION Pittsburgh, Pa.

BETHLEHEM BETHLEHEM STEEL COMPANY HM"

"MO-CUT"

BRAEBURN ALLOY STEEL CORPORATION Braeburn, Pa.

"MOHICAN" CANADIAN ATLAS

STEELS, LTD Welland, Ont.

"STAR MAX" CARPENTER STEEL COMPANY Reading, Pa.

"MOLITE 8" COLUMBIA TOOL STEEL COMPANY Chicago Heights, III.

"REX T-MO" CRUCIBLE STEEL CO. New York, N. Y.

"DI-MOL" HENRY DISSTON

"REX T-MO" HALCOMB STEEL Syracuse, N. Y.

"MOGUL" JESSOP STEEL Washington, Pa.

"TATMO" LATROBE ELECTRIC STEEL COMPANY

SIMONDS SAW & STEEL COMPANY

"8-N-2"

"MO-TUNG" UNIVERSAL-CYCLOPS STEEL CORPORATION Bridgeville, Pa.

"VUL-MO" VULCAN CRUCIBLE Aliquippa, Pa.



New Enlarged Handbook Gives Facts About This **Unusual High Speed Steel**

• The Fifth Edition of the 57-page MO-MAX Handbook gives a wealth of information about high speed steels. Whether or not you are now using MO-MAX, you should send for a copy of this clear, concise booklet.

Included among its contents are details on the standard and special analyses of MO-MAX . . . brief instructions on forging, annealing, hardening, quenching, tempering . . . the new sub-zero treatments . . . tool performance . . . comparison of microstructures of MO-MAX and 18-4-1 high speed steels . . . Rockwell hardness curves and other informative charts.

Tests conducted over a period of years have proven that MO-MAX gives better-than-average performance in drills, reamers, lathe tools, cut-off tools, tool bits, milling cutters, hobs, circular saws, thread rolling dies, counterbores, broaches, lathe centers, spot facers, circular and flat forming tools, dies for both hot and cold work, taps, thread chasers, etc. The new Handbook tells how you, too, can utilize the advantages of this remarkable high speed steel. Use the coupon below.

THE CLEVELAND TWIST DRILL CO: Cleveland, Ohio 1256 East 49th Street

11.

SENI	COUPON	TODAY-
CLEVELAND	TWIST DRILL CO.	

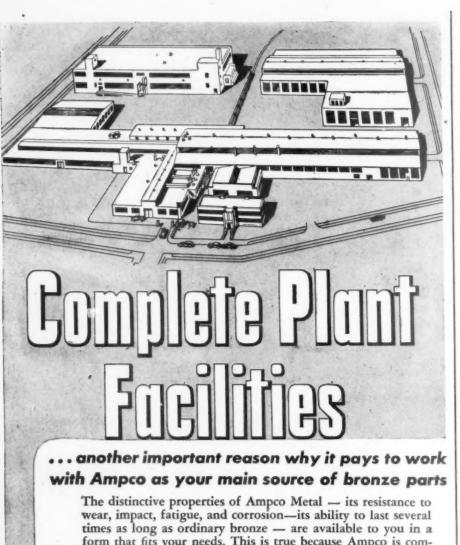
1256 East 49th Street, Dept. B, Cleveland 14, Ohio Gentlemen: At no obligation to me whatsoever, please mail me a copy of the Fifth Edition of the MO-MAX Handbook.

Address

Business Connection_



APRIL,



form that fits your needs. This is true because Ampco is com-

Ampco Metal

pletely equipped to produce and work the metal by every commonly used process. By constant research and experimentation, Ampco has continually added new processes, giving results heretofore impossible with this particular material. Specify Ampco Metal with confidence that the Ampco organization can provide the engineering and production "know-how" and the specialized plant facilities to. deliver the part you want.

Ampco Metal, Inc. Diversified production facilities Dept. P-4, Milwaukee 4, Wis. Ampco Field Offices in Principal Cities Production Control-Bether

> - may suggest additional improvements in bronze parts or a better way of fabricating them. Ask for it today.

When You Buy **Plastics**

(Continued from page 320)

factor when machining both the thermosetting and the thermoplastic materials; nor do they wear down as quickly as other tools when working thermosetting materials of the abrasive type.

In conclusion Mr. Groos stated that choosing plastic for a job is not just a matter of "deciding to use" a plastic even though such factors as acid and alkali, heat and electrical resistance and other qualities are unimportant. It would be folly, for instance, to use certain types of phenolies for light products subject, to rough handling for they do not have the high impact or shock resisting qualities of the cellulosic materials.

End-Use Satisfaction

Furthermore, some plastics have certain plus or minus qualities that are often overlooked in the generali-Polystyrene, for example, zations. though it has excellent acid resisting qualities, is adversely affected by essential oils. A competent molder would advise against its use where essential oils are involved because he knows that the oil would cause the plastic to craze and spoil the job. There are many inhibiting restric-tions of this sort, of which molders have gained knowledge through laboratory work, study and experience. Mistakes in plastics selection have been made for the simple reason that the end use of a product was not carefully analyzed.

On the other hand, it is agreed that unit cost may be a deciding factor, and it may be safe and satisfactory to make plastic selection based on cost, for many general use products. For example, the phenolic molding materials are much cheaper than the urea molding materials, and if a buyer is willing to sacrifice on the color factor in order to get a good price per unit, the way is open to have a good deal of money by the The use of a phenolic compound. end-use of a product should be the guide in making decision.

Undoubtedly as commerce and industry become more familiar with plastics and their multitude of uses, members of the purchasing clan will acquire the background that is essential to efficient procurement. But as in any other production having technical involvements, the logical and least expensive policy is to consult with men who have the "knowhow" of plastics use and fabrication.

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EYE APPEAL

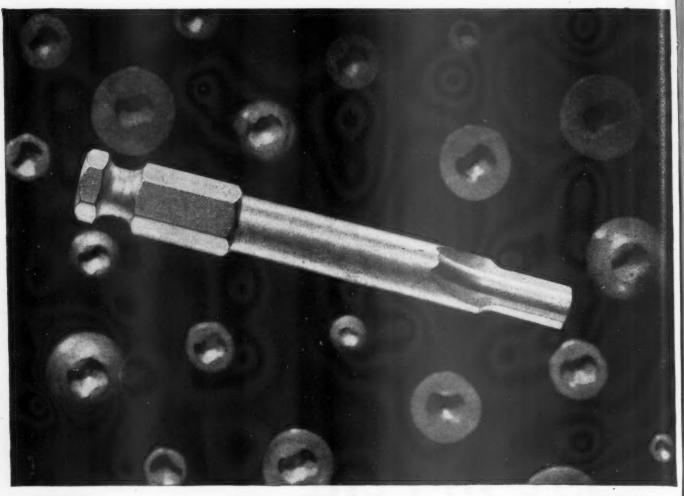
The power of attraction — through eye appeal — means consumer attention and positive product identification.

Colorful Palm Brothers Decals command such attention — give you the product identification you desire.

Regardless of surface, Palm Brothers Decals are easily applied. Magnetic in color, economical in price, remarkable in durability, they are your marks of distinction . . . exclusively yours.

Palm Brothers Decals spell the difference between dynamic product identification and mediocrity.







CLUTCH HEAD users have the answer to this question . . . for that is how they measure the economy and efficiency of screw driving on their assembly lines.

The explanation of this unequalled "high-score" driving is simple. It lies in the ruggedness and design of the Type "A" Bit. This ruggedness is self-evident and is made possible ONLY by the mating design of the Clutch recess. This means stamina to stand up through a longer driving spell, free from tool change interputions . . . speeding up the production tempo and rolling up the record of thousand upon thousand of extra screws per bit.

Note, too, that the driving score of this bit is multiplied time and time again because it may be repeatedly restored to original efficiency by a 60-second application of the end surface to a grinding wheel.

Other special features incorporated in CLUTCH HEAD Screws contribute importantly to greater safety, higher production, and lower costs. We invite your personal investigation of these and will send you, BY MAIL, package assortment of CLUTCH HEAD Screws, sample Type "A" Bit, and illustrated Brochure.

Being operative with an ordinary screwdriver or any flat blade of reasonably accurate width, this is THE ONLY MODERN SCREW that simplifies your field service problems.



Note the straight-walled Clutch matched by straight-sided driver for square engagement, eliminating "ride-out" tendency with hazard of slippage as set up by tapered driving.



UNITED SCREW AND BOLT CORPORATION
CHICAGO 8 CLEVELAND 2 NEW YORK 7

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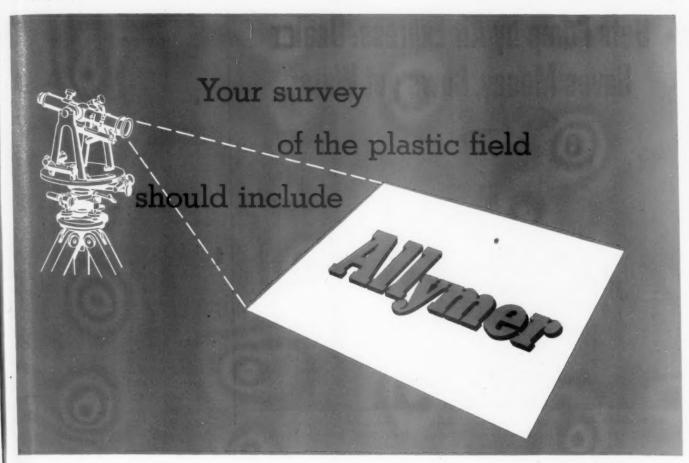
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Still new—but proved in important wartime applications—Columbia's Allymers merit consideration for products requiring crystal-clear castings or high-strength laminations. In the three basic Allymer types—or their modifications—you may find the material which precisely meets your production needs for direct polymerization, laminates, or for copolymers.

The Allymers are thermosetting, contact-pressure monomers which can be stored for relatively long periods without the use of inhibitors. They are easily handled and evolve no gaseous or other by-products in polymerization. They are—depending upon the type—either non-irritating to the skin or require only slight care to avoid skin irritation. Here is a brief description of their individual characteristics:

Allymer CR 39—A monomeric liquid of low volatility which, when heated in the presence of a peroxide catalyst, is transformed into a hard, insoluble, infusible, glass-clear solid. It affords an unusually high degree of optical clarity—89-92% light transmission per 1/4" thickness. Also available in sheets, rods and tubes.

Allymer CR 149—a crystalline monomer which, with gentle warming, becomes a viscous liquid and on exposure to a peroxide catalyst with heat, assumes a structure similar to Allymer CR 39. Especially desirable for laminated products where high strength and lightness of weight are essential.

Allymer 170—A liquid monomer, noteworthy for faster curing. It may be modified in any proportion with the other Allymers to attain desired properties.



DATA AND SAMPLES FURNISHED ON REQUEST

Comprehensive data and reports of extensive research will be provided on request. Though not essential, a statement of your intended use will be helpful in supplying specific information desired and samples appropriate for experiment.

COLUMBIA CHEMICALS

PITTSBURGH PLATE GLASS COMPANY
COLUMBIA CHEMICAL DIVISION
GRANT BUILDING • PITTSBURGH 19, PA.

CHICAGO . BOSTON . ST. LOUIS . PITTSBURGH . NEW YORK . CINCINNATI . CLEVELAND . PHILADELPHIA . MINNEAPOLIS . CHARLOTTE . LOS ANGELES

Gets Pump by Air Express: Dealer Saves Money, Cows get Water



WATER PUMP on Wisconsin dairy farm breaks down. The owner gives his local dealer a hurry-up call. Dealer promises quick delivery even though pump must come from Cleveland. (He has it in the morning by specifying Air Express.)



DEALER ABSORBS Air Express charges but, even so, he figures a saving of money - because the pump is a high-priced, slow-turn unit that he cannot afford to stock. (With Air Express the nation's inventory is within hours of your business.)



THOUSANDS of businessmen find this fastest delivery a real economy - a real money-- when a customer wants something not in stock. (Yes, with Air Express, you give high-speed service on high-priced items without cost of stocking.)

Specify Air Express — Low Cost for High Speed

25 lbs., for instance, travels more than 500 miles for \$4.38, more than 1,000 miles for \$8.75, more than 2,000 miles for \$17.50, at a speed of three miles a minute — with cost including special pick-up and delivery in all U. S. cities and principal towns. Sameday delivery between many airport towns and cities. Direct service to scores of foreign countries. Rapid air-rail service to 23,000 off-airline points in the United States.



ETS THERE FIRST

Write Today for "Quizzical Quizz", a booklet packed with facts that will help you Solve many a shipping problem. Railway Express Agency, Air Express Division, 230 Park Avenue, New York 17. Or ask for it at any Airline or Express office.

ne RAILWAY EXPRESS AGENCY, AIR EXPRESS DIVISION Representing the AIRLINES of the United States

The Customer Is **Nearly Always Right**

(Continued from page 81)

his questions. The presumption is that there isn't any answer, but the "dullest copy of the year" is quite specific on the first two pointsuniformity of dimensions, of wall thickness at all points, of interior surface smoothness; guarantee welding fittings . . . sound, dependable . . ready for good, long, hard service. As for the rest, it is quite possible that the purchasing agent is impressed and interested because of some unfortunate experience with competitive products that were not adequately inspected. It is quite possible that there is a trade jargon incomprehensible to the critic but entirely understandable to the fellows who make and buy and use the product. This ad copy brought product and prospect together on common ground. It is quite possible, in other words, that the "rules of industrial advertising" upon which

the critic places such uncompromising reliance may be wrong, and that the ad is right. Mr. The Copy Chasers writhes at "those extremely corny phrases like

'constant vigilance'—as annoying (they must be, they are so overused) as they are meaningless. Let's take a look at some words he likes-likes well enough to bestow his star upon them. The copy refers to a new container: "Full of such action-making words as Now, Revolutionary, Introduce, New, etc." He is impressed. "Looks like a lot of bottle to us," he says, and maybe it is. But oh, Mr. The Copy Chasers, you should sit for an hour in a purchasing agent's office, or in an industrial magazine editor's office. to see at what a discount those words are selling. For the readers have seen too many new and revolutionary products whose newness consisted in using green paint instead of black, or a cap screw in place of a bolt. If that is still in your book of rules ("Hell, a news announcement ad is bound to be good"-TCC) you would do well to pencil a question mark in the margin against the day when the customer's opinion is honored by

your attention. And here's another one that gets the star, plus the citation: "Socko headline . . . by comparison, it makes 99 per cent of all industrial advertising look bad." High praise indeed-as well as rather sweeping condemnation. The headline reads "Muzak Has DEFINITELY Built

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... then the lights went out!

T was a major operation. Nurses and internes stood by alert, expectant. The surgeon had severed and clipped the last obstructing artery. Then the lights went out! This can happen, for despite all precautions of utility companies, accidents beyond their control can cause interruptions of normal electric current. But in the hospital that is equipped with an Exide Emergency Lighting System, lights flash back at once. Industries, too, can profitably

employ this system—safeguarding workers, and assuring uninterrupted operation in times of lighting emergencies.

There is a dependable Exide for every storage battery need. Exide Batteries furnish motive power for the efficient, time-saving, electric industrial truck... the modern, economical method of handling materials. Exides provide light and air-conditioning for railway cars, and power for the signal systems. They perform scores of duties on ocean-going vessels. They supply electric current for the multiple needs of bombers, fighter planes and commercial airliners. They serve industry in numerous ways. And in millions of cars, trucks and buses they are proving daily that "When it's an Exide,

you start."

For 57 years Exides have been demonstrating their dependability, long-life and ease of maintenance. If there are any questions you would like to ask regarding the application of storage batteries to your particular needs, Exide engineers will be glad to answer them.



THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

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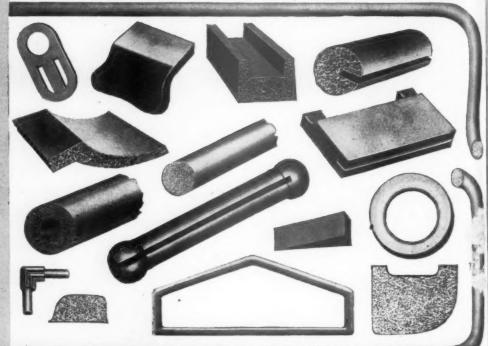
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Available Now! CELLULAR RUBBER IN VARIOUS SHAPES AND FORMS

FOR DAMPENING SOUND OR VIBRATION SEALING INSULATING GASKETING CUSHIONING WEATHER-STRIPPING SPACE **FILLING** DUST **PROOFING** SHOCK ABSORPTION PROTECTIVE PACKING



Cellular Rubber is going places and performing worthwhile service throughout American industry. Have you investigated its advantages?

The unique properties of this modern material – due to its cellular structure and control of its weight and strength, and, where needed, its inbuilt resistance to oils, electricity, chemicals, oxidation and abrasion – result in a decided superiority for hundreds of applications.

To fit your needs – Cellular Rubber is compounded and produced to order in practically any form – molded to shape, in die cut designs, or in bulk form such as sheets, slabs, strips, cord, tubing, or bonded to fabrics.

Available now in any of its basic structures – SPONGEX* with interconnecting cells – CELL-TITE* soft with individual cells – or rubberized curled hair or bound fibre for cushioning and packing delicate instruments.

Why not send for samples and prices? *Trade Mark Reg. U. S. Pat. Off.

Sponge Rubber Products Co.

132 Derby Place, Shelton, Conn. . Plants in Derby and Shelton, Conn.

Sales Offices: New York • Chicago • Washington • Detroit

WORLD'S LARGEST MANUFACTURERS OF CELLULAR RUBBER AND BONDED FIBRE PRODUCTS

Stabilizing stainless steel

AUSTENITIC stainless steel exposed in fabrication or service to temperatures between 900° and 1500° F. must stabilized to prevent intergranular rosion embrittlement.

Tranium is the most economical of the deral present methods of stabilizing stainless steel and the supply of titanium is unlimited.

For heat resistance, for tube piercing and for formability titanium stainless steel is the choice of experience.

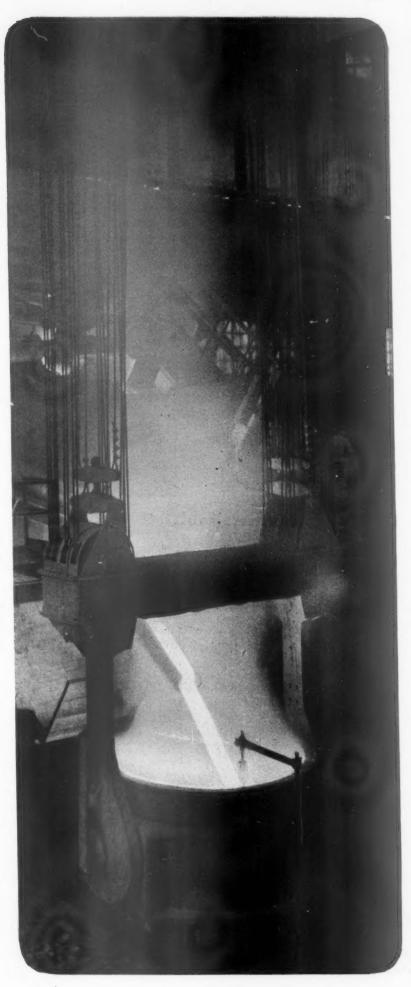
If you are using stainless steel at high temperatures one of our technical staff will be glad to explain the advantages of titanium to you.

TITANIUM ALLOY MANUFACTURING CO.

Executive Offices: 111 BROADWAY, NEW YORK, N. Y. General Offices and Works: NIAGARA FALLS, N. Y.



UCTS



APRIL.



New Ideas for STRUCTURAL PLANNING

Write for Your Copy

"The best guide in the industry for open steel flooring construction." That's what hundreds of plant managers and superintendents call the new BATES . GRATES illustrated catalog. It's particularly valuable now for making necessary structural changes. And, it gives you vital information on how to improve plant design.

WHAT THIS BOOK TELLS YOU



How to increase the strength and load-carrying ability of your steel treads and flooring.



How to make your steel flooring safer-free from grease, water and other slip-encouragers.



How to ease your floor and stair tread maintenance problems by eliminating hazardous, grease-catching structures.



How to determine the exact safe loads for open steel flooring-by using the handy BATES chart.

. . and many other important facts for construction planning now and after the war. Be sure to send for your copy of the new BATES · GRATES catalog today.

ES•GRATE

WALTER BATES COMPANY, INC. JOLIET . ILLINOIS

OPEN STEEL FLOORING . STAIR TREADS

The Customer Is **Nearly Always Right**

(Continued from page 326)

Up Efficiency In Our Plant." The socko feature is the word DEFI-NITELY, which appears in capital letters and underlined. It adds nothing whatever to the simple statement that would remain if this word were deleted. To this inexpert reader, it is rather on the corny, annoying, and meaningless side. But it's good, according to the rule book, because most of these dynamic action words have been so overworked in socko headlines that language itself is beginning to lose its meaning. Was it a copy writer who walked right through the doorway marked "No Admittance" because it didn't say "POSITIVELY No Admit-tance. THIS MEANS YOU"?

The purchasing agent summed up his commentary, "This ad was liked because its arrangement attracted attention, sold one idea, and let the reader go on to the next page." And that is labelled by the expert as "a kiss of death, if we ever saw one?"

Why, Mr. The Copy Chasers? Was he expected to sit indefinitely rapt in contemplation of some piece of socko copy? That would have made him late for the meeting, which you might have considered a desirable result. He might never have reached the next page, where another advertising story competed for his attention, possibly one of your starred examples. But more to the point: Whether you like it or not, the job of layout is to attract attention, the job of the advertisement is to sell an idea, and the job of this particular reader was to read the ads and get back to purchasing, where he could apply that idea. Let's remember that advertising exists for a purpose, and let's judge it by results. If you are interested in results, "how can you tell unless you ask?"

The tirade against consumer juries concludes with a reference that is in as poor taste as it is illhumored, a final revealing and notso-socko commentary on the customer and his opinion—"the unstudied, unsupported reflection of persons who, like the monkey on the end of the stick, don't know what it is that makes them jump.

As long as we are at the zoo, let's not overlook the ass who trudges along the narrow treadmill between the blinders of his own conceit, blissfully unaware that he'll never get anywhere that way.

SIMONDS GEARS



QUALITY GEARS OF ALL TYPES ... MADE TO YOUR ORDER

SPUR · BEVEL · MITRE WORMS · WORM GEARS · RACKS Cast and Forged Steel, Gray Iron. Bronze, Silent Steel, Rawhide, **Bakelite**

Distributors of RAMSEY Silent Chain Drives & Couplings

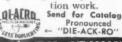
THE SIMONDS GEAR & MFG. CO. 25TH AT LIBERTY PITTSBURGH 22, PA.



"Enclosed picture in our plant proves the DI-ACRO Bender will do a real production job. We are making 4,000 completed parts per day which is competitive to most Power Presses." (Name on

Request.)

Here is an example of "DIE-LESS DUPLICA-TING" typical of a great variety of formed parts readily made with DI-ACRO Precision Machines, Benders, Brakes, Shears. Picture above shows the finished part formed to die precision. Women operating DI-ACRO units maintain a high out-put on produc-



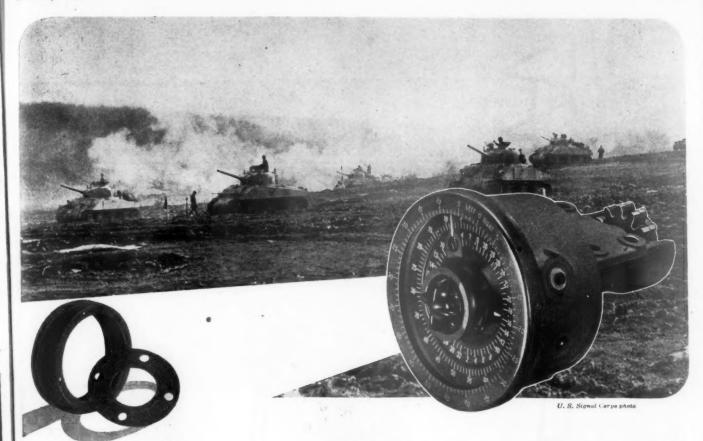


DI-ACRO

BENDER

No.1

'neil-irwin 305 Eighth Avenue So., Minneapolis 15, Minn.



The Aim is ... ACCURACY!

Tanks and tank destroyers now serve a dual function . . . for close range fire-power and as mobile, armored artillery units with an effective range of several miles.

A precision aiming device . . . called the AZIMUTH INDICATOR . . . enables the crews of tanks and tank destroyers to quickly adjust a gun turret to a direct horizontal and, with the aid of reconnaissance planes, the device accurately and quickly courses the aiming for the transverse position.

The azimuth indicator (illustrated) is made by the Beam Manufacturing Company of Webster City, lowa. The rubber parts (illustrated) are produced for "Beam" by The Ohio Rubber Company. Like all components of the azimuth indicator, these rubber parts must conform to rigid standards.

From beginning of manufacture to "end use" of the azimuth indicator, the aim is ACCURACY. When YOUR aim is accuracy in mechanical molded and extruded rubber or synthetic rubber parts—call for—

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WHEN THE PRESSURE IS ON, packing for valves, pistons, hydraulic cylinders, steam hammers, and other heavy-duty equipment has to have special strength.

R/M makes thirteen different types of heavyduty packing, either woven of metal, or reinforced with wire or metal tubes for pressures up to 5,000 pounds.

More than forty years of successful experience in such applications have led to the design of these packings and to the choice of materials used.

And each different type comes in a number of sizes to fit every type of standard equipment.

Whatever your packing need, there is an R/M packing specially designed to fit it. Ask for R/M at your distributor's.

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KATHANODE POSITIVE GRID with its box-type pockets and reinforcing bar.



BLACK OXIDE active material with its core of pure lead.



GLASSKLAD spun glass retainer mat pioneered in America by Gould.



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Gould research and Gould's half century of battery experience are responsible for these exclusive features: (1) The Kathanode grid for long life and high conductivity. (2) Black Oxide active material for sustained capacity. (3) Glassklad protection to minimize power loss.

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of your battery, and assure sustained power throughout a long battery life. Only when you buy a Gould Kathanode do you get these distinctive features pioneered by Gould. For 20 years "Glassklad", developed by Gould for its Kathanode battery, has meant long life and outstanding performance.

333

Write Dept. 43 for Catalog 100 on Gould Kathanode Glassklad Batteries for Industrial Truck and Tractor Service.

GOULD

SINCE 1898... THE BATTERY PICKED BY ENGINEERS

FOR EXCELLENCE IN STORAGE BATTERY PRODUCTION AT DEPEW PLANT

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USE OF INDUSTRIAL X-RAY EQUIPMENT EXPANDS

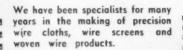
W ARTIME needs have developed widely diversified types of X-ray equipment, in both medical and industrial fields, the War Production Board reports in a statement on the current uses of X-ray equipment.

X-ray examination of materials and finished products was little used by industry before the war, though the techniques have been known and employed on a small scale for the last 30 years, WPB said. At present, X-ray inspection of materials and component parts is required in the manufacture of virtually all combat materiel. The X-ray equipment used varies in weight from a few pounds to several tons and uses current with voltages ranging from 4,000 to 2,000,000 volts. Tiny instrument parts, the steel plates of battleships, 30 caliber cartridges and shells of 10 inches or more in diameter are some of the many items given routine X-ray tests to assure standard performance. This X-ray examination makes it possible to ascertain that the internal structure of materials is free from defects before they are machined and assembled. The specimen examined is not harmed

In the medical field, X-ray equipment has been of prime importance in the care of battle casualties, in thorough physical examination before assignment to actual military service, and in the care of the civilian population, WPB said. An example of battle use is the mobile X-ray field unit, which receives its electric power from portable generators driven by internal combustion engines. This unit makes it possible to give fairly complete X-ray service to battle casualties in field hospitals

LUDLOW SAYLOR

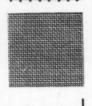
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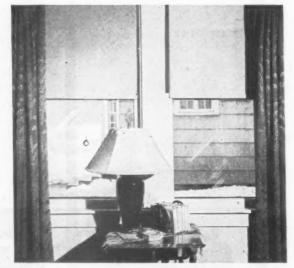


"Perfect" "Perfect" "Perfect" "Perfect" alloys and Wire Cloth Wire Cloth Wire Cloth products metals weaves processing Super-Loy Arch-Crimp Bending Baskets Coiled Binding Circles Double-Crimp Galvanized Cones Brazing Double-Fill Tinned Calendering Crotes Stainless Dutch Clinching Cylinders Filter Discs Steels Cutting Nickel-Chromium Flat-Top **Forms** Dipping Herringbone-Dishing Leaves alloys Twill Aluminum Lengths Flanging Intermediate-Flattening **Panels** High **Pieces** Crimp Forming Low Rek-Tang Racks Framina Bronze Ribbons Selvage-Edge Galvanizing Commercial Rolls Straight-Warp **Painting** Phosphor Sections Shearing Stranded Copper Segments Monel Metal Sta-Tru Slitting Spacers Nickel Triple-Warp Trimming Strips Any special al-Arc-Welding Twilled Template loys available Twisted-Fill Gas-Welding in rod or wire shapes Twisted-Warp Spot-Welding Trays

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CENTRAL PAPER COMPANY INC. 2446 Lakeshore Drive . Muskegon, Michigan

close to combat areas. The X-ray films developed in the field hospitals are generally attached to the field diagnoses which go with wounded to hospitals more removed from the combat zones.

X-ray equipment is manufactured by 23 companies, WPB said, with the bulk of production coming from

plants in Chicago, Cleveland and Baltimore.

ELECTRONICS TO EXTEND USE OF ELECTRIC POWER

D.R. Ernst F. W. Alexanderson, General Electric consulting engineer and radio expert, was recently awarded the Edison Medal of 1944, in recognition of his outstanding inventions and developments in the radio, transportation, marine, and power fields.

In accepting the award Dr. Alexanderson predicted that in the postwar years "we may hope for the discovery of entirely new sources of energy which will extend the use of electric power." Homes will be heated as well as cooled by electricity, ocean-going ships will be propelled by motors fed from coal-burning gas turbines, and railroads will be universally electrified. Furthermore, the scientist said, "Electronics will revitalize the electrical industry with new experiences, new tools, and new ideas."

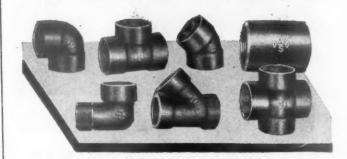
Inventor of the alternator which made the first radio broadcast possible, Dr. Alexanderson holds some 300 important patents in radio telephony and telegraphy, television, motors, generators, power transmission, vacuum tubes for radio and power rectifiers, electric

ship propulsion, and electric traction.



"PERFORMANCE-PROVED" QUALITY

IN W-S FORGED STEEL PIPE FITTINGS



MEANS EXTRA STRENGTH ... SAFETY... SERVICE

THE COMPLETE LINE of Watson-Stillman Forged Steel Pipe Fittings is manufactured under the same Quality procedures that have characterized all Watson-Stillman products during 97 years of experience in dealing with high pressures. Available to you in Screw and Socket Welding types-in Carbon Steel, Carbon-Molybdenum Steel, Chromium-

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both through a courately cut, perfectly aligned, for quick, easy installation. Uniform wall thickness throughout assure a higher factor of safety. Long low bands extend beyond last thread to insure extra strength and better wrench grip. Sizes: V8" through 4" 1.P.S., 2000—3000—6000 Pound Classes.

SOCKET WELDED TYPE

SOCKET WELDED TYPE
Speed up and simplify installation because deeper sockets
eliminate necessity of cutting
pipe to exact lengths. The deep
socket furnishes support for the
pipe and provides self-alignment. No special fixtures are
needed for lining up and holding joints. PROYED WELDABILITY. Sizes: 1/4" through 4"
I.P.S. For Schedule 40-80-160
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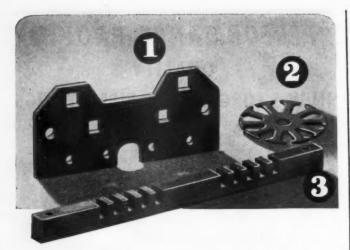




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The versatility of Taylor Laminated Plastics makes possible the fabrication of parts with structural, mechanical, and electrical properties to fit almost any engineering problem involving the mass-production of small, accurately-sized parts.

The three parts illustrated above, for example, selected at random from thousands of such parts being turned out daily in the modern Taylor plant, involve two different types of Phenol Fibre and one of Vulcanized Fibre. No. 1 is a switch back machined from Phenol Fibre and having excellent moisture-resistance and electrical properties. No. 2 is an end lamina for a fractional horsepower motor, punched and formed from Vulcanized Fibre. No. 3 is a coil bar support for a secret electronic device which is sawed, milled and drilled from Phenol Fibre having especially good insulating qualities and mechanical strength.

If your production problem involves great quantities of parts with light weight, great strength, and special insulating or dielectric qualities, let our engineers tell you what Taylor can do for you.

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LAMINATED PLASTICS: PHENOL FIBRE • VULCANIZED FIBRE Sheets, Rods, Tubes, and Fabricated Parts

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PACIFIC COAST HEADQUARTERS: 544 S. San Pedro Street, Los Angeles

SYNTHETIC RUBBER PRODUCED AT RATE OF 850,000 TONS A YEAR

A MERICA's long-range rubber policies should be decided by the people through their elected representatives in government and decisions affecting the nation's rubber outlook should be founded on national security above all else, John L. Collyer, president of The B. F. Goodrich Company, Akron, Ohio, told a meeting of the Pittsburgh Chamber of Commerce.

"It will be two or more years after the liberation of the Eastern rubber plantations before capacity production of synthetic rubber and deliveries of natural rubber to consuming countries will exceed world consumption," he declared. "Unlike most other international problems this interval affords ample time for fact-finding and for formulating sound policies and a start in this direction has been made.

"Synthetic rubber of all types is now being produced in the United States at the rate of about 850,000 tons a year and before the end of 1945 this rate will probably be stepped up to a million tons a year. This record production of man-made rubber has been accomplished in three years since the fall of Singapore.

"United States consumption of rubber,—natural and synthetic—in 1944 was 713,000 tons of which 80 per cent was American-made synthetic.

"Toward the end of last year a new top priority program for the production of military tires was announced, and consumption of rubber may approach 900,000 tons in 1945 of which more than 85 per cent will be synthetic.

"It is now estimated that the potential yearly production of natural rubber from all world sources will total 1,500,000 tons after the war. Postwar potential yearly



FLEXIBLE STEEL LACING CO.
4697 LEXINGTON ST., CHICAGO 44, ILLINOIS

Also sole manufacturers of Alligator Steel Belt Lacing for flat transmission belts. Alligator V-belt Fasteners for V-belts and Flexco HD Belt Fasteners and Rip Plates for fastening and repairing conveyor belts.

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production of man-made rubber will approximate 1,300,-000 tons making a possible world supply of about 2,800,-000tons of both types which is nearly three times the average world consumption of 1,100,000 for the three

years from 1939 through 1941.

"Nothing must be permitted to stand in the way of winning the war as quickly as possible and with the least suffering and loss of human life. Nevertheless, it is now time that we the people should be seriously thinking about the long-range political and economic problems resulting from the existence of America's synthetic rubber-making capacity.'

CONTRACTORS MUST KEEP UP-TO-DATE ON TERMINATION REGULATIONS

THE Joint Army-Navy Termination Regulation is the "Bible" for war contractors to be used in the rapid settlement of war contracts. A recent survey discloses that less than 40% of the war contractors circularized had availed themselves of this publication. A Joint Army-Navy Distribution Center has been established at 90 Church Street, New York, New York, to distribute this publication together with other printed material pertaining to contract settlement.

It is imperative that contractors holding war contracts be placed on the mailing list for the Regulation and all

subsequent changes.

There is no charge for any publication distributed by this office. Contractors merely have to write to the Joint Army-Navy Distribution Center, 90 Church Street, New York, New York, Attention: Lt. E. P. Lull, and copies will be forthcoming.





Plan your product to be a winner \dots in the face of keen future competition by using Harper Everlasting Fastenings—the fastenings that (1) resist rust and corrosion, (2) stand up in the presence of many acids, alkalies and other tough conditions, (3) add years of service life AT LOW COST, (4) can be removed with ordinary tools and used again and again. Every Harper fastening is made of either brass, copper, naval bronze, silicon bronze, Monel or stainless steel (nothing in common steel).

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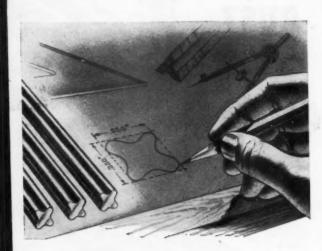
Harper is known as "Headquarters for Non-Ferrous and Stainless Fastenings"....carries large and complete stocks of 4360 different items and is continually adding others maintains large stocks of metals in bars, rods, wire, sheet and other basic forms from which special fastenings can be quickly made. Write for 1945 Catalog.

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PAGE is now drawing wire in many shapes -triangles, rectangles, octagons, hexagons, keystones, ovals, half-rounds, many other hard-to-describe special shapes. But, if you have use for shaped wire in the manufacture of your product, you are not limited to standard shapes. You draw the shape—PAGE can draw the wire.

· Yes, and PAGE will go further than that. From years of experience, PAGE has learned much about the economical application of shaped wire to manufacture. PAGE offers you the benefit of this experience in finding ways to cut your production costs through the use of shaped wire.

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Specifically, PAGE Shaped Wire is made in sectional areas to .250" square—widths to 3/8"of carbon or stainless steels

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NEW FUELS AND METALS FORECAST TOP-EFFICIENCY MOTORS

NCREASED power production by internal-combustion engines at lower cost is likely to result from accelerated wartime progress in automotive engineering according to a technical article in March SAE Journal.

Improvements in fuels and materials are heralded by the author, Forest S. Baster, engineering vice-president, The White Motor Co., Cleveland, Ohio, as basic factors. He reports expectations that 90-octane non-premium gasolines will give commercial vehicles road performance superior to that possible from prewar fuels of aviation grade, and says that top-efficiency engines can be built from alloys of aluminum and magnesium priced competitively with cast iron.

Mr. Baster foresees engines of 160 horsepower developing 200 horse-power when supercharged and giving motor trucks and buses necessary speed and agility for effective use of tomorrow's faster and longer highways. He estimates that improvements in fuels and higher compression ratios alone will increase engine efficiency 10 to 15 percent.

Overall improvement of future engines is ascribed to expected design improvements, including supercharging, to take advantage of the full power inherent in post-war fuels; bearings which accommodate pressures of 2,000 pounds per square inch; automatic camshaft timing change mechanisms giving top efficiency at all engine speeds; injection carburetion; new low tension ignition systems; and new spark plug electrode materials which multiply by 10 the length of operating periods.

(Continued on page 340)

THREAD BOLTS?



This patented dieholder — with large opening below die for instant clearance of turnings - is available for either the Nos. 2 or 3 BEAVER Drophead Ratchet Pipe Threaders. Eliminates torn threads due to chips packing in the die.

Write for Catalog 44

445 GROW AVENUE WARREN, OHIO

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More than by indust popularity refresher With Aer's in advance is kept

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With AerVoiDs hot coffee can be prepared hours in advance of the time of serving, transferred from urns to AerVoiDs, where it is kept hot, sealed against contamination, transportable anywhere indoors or outdoors around a large plant for servicing to workers at their work, a cup at a

time, direct from AerVoiD carriers.

Write for Industrial Coffee Servicing Envelope No. 1145 A

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"AerVoiD" Vacuum Insulated Carriers for Storing, Transporting, Serving HOT COFFEE





The Engineer Says

"WHAT A RELIEF!"

Many a power plant engineer has made this remark after installing Garlock Packings and Gaskets. No more leaks in boilers, pipe lines and pumps—and everybody's happy!

Garlock products give long, dependable service because they are manufactured in our own plant and are *quality-controlled* from raw material to finished product.

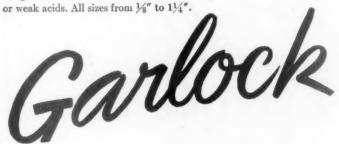
THE GARLOCK PACKING COMPANY PALMYRA, NEW YORK

Manufacturers of Garlock Packings, Gaskets and
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GARLOCK 234 gives long, dependable service on rotary or centrifugal pumps handling hot water, cold water, caustic solutions or weak acids. All sizes from 1/4" to 11/4".



THE UNEXPECTED STRAINS and STRESSES

To guard against the hard jolts, the unusual strains and stresses of today's rough and hurried handling, these elements are absolutely essential to perfect shipping:

- 1. A super-tough tape that stays stuck!
- Proper sealing equipment, properly cared for; kept clean, with water or solvent level properly maintained.
- 3. The knowledge of how to do the best kind of sealing job.

If you are not sure that the best methods are being used in your shipping department, call in your paper merchant or write to the Tanglefoot Company. We are prepared to give you complete information or send a representative to assist you with any sealing problem. To use tape improperly is to waste essential materials.

THE TANGLEFOOT COMPANY 401 Straight Street, S.W. Grand Rapids 4, Mich.



(Continued from page 338)

Of interest to operators of privately-owned, as well as of commercial vehicles, is Mr. Baster's proposal for the replacement, through the application of electronics and of radio tubes to the job of spark timing, of the traditionally troublesome distributor and its temperamental points.

GASOLINE TRUCK-TRAILER TRUCK CAPACITY

THE Quartermaster Corps has adopted a new trucktrailer unit to be used in the transportation of gasoline and other petroleum products.

Production of the new 5,000-gallon units, whose capacity will more than double that of the 2,000-gallon semi-trailers which they are to replace, is to begin immediately. However, it is expected that some months will be required to produce the trucks and trailers in sufficient numbers to permit their widespread use in overseas theaters.

The truck portion of the new unit is of 6-ton capacity, with six wheels, while the trailer section is of $7\frac{1}{2}$ -ton capacity and also has six wheels. Truck and trailer each will carry a maximum of 2,500 gallons of gasoline.

The new equipment will be used principally by Quartermaster heavy Truck Companies which are organized as petroleum transportation units. When the new carriers are produced in sufficiently large quantities, they will take the place of the 2,000-gallon semi-trailers which are now part of the organic equipment of these companies.



Here, in the Bendix-Weiss Constant Velocity Universal Joint, Strom Balls do their part in making military vehicles, from Jeeps to 14-ton Armored Cars, the efficient fighting equipment that they are. This is only one spot in our great war production effort where the high degree of perfection of Strom Balls serves industry, enabling it to provide the finest bearing equipment towards its great contribution to total victory. Strom Steel Ball Company, 1850 South 54th Avenue, Cicero 50, Ill.

Largest Independent and Exclusive Metal Ball Manufacturer



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When the new type equipment is placed in operation, it will reduce by 50 per cent the number of vehicles in the Heavy Truck Companies, and will at the same time increase the companies' carrying capacity from 96,000 to 120,000 gallons of gasoline.

Experimentation which led to the development of the truck-trailer gasoline units was conducted by the Ordnance Department at the request of the Quartermaster Corps, and was initially instituted almost a year

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Work on the newly developed units was handled for the Quartermaster Corps by the Fuels and Lubricants Division of the Office of The Quartermaster General.

X-RAY INSPECTIONS TO AID POST WAR INDUSTRY

S PECIAL quality control applications of industrial x-ray equipment, worked out to provide America's record-breaking production for war, will mean better post-war products at lowered manufacturing costs, Don Morgan, Supervisor of Industrial X-Ray Application Engineering, Westinghouse Electric and Manufacturing Company, recently told members of the Cumberland Engineering Society and the Southern Engineering Society at Cumberland and Hagerstown, Maryland.

Pointing out that just as medical x-ray came into widespread use as a result of experiences during World War I, so industrial x-ray is coming of age in the

present conflict, Mr. Morgan said:

"Industrial x-ray applications were not unknown before the present war, but because the art was not well (Continued on page 342)

Since 1912 we have been selling fine diamonds. Our values aré outstanding. Selections sent for inspection without obligation.



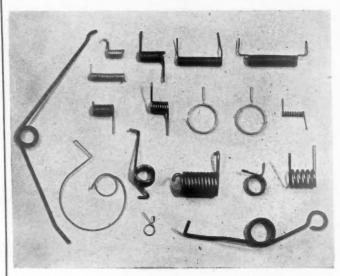
L. & C. MAYERS CO.

ESTABLISHED 1912

545 FIFTH AVENUE

NEW YORK







Springs cost little but mean much. A single spring is often the determining factor in the functioning of a critical mechanism. The failure of one small, inexpensive spring may cause the breakdown of

a complex machine, with attendant loss of time, money, production - even life or limb itself.

Reliable specializes in the design and production of springs to high precision standards — springs exactly adapted in every detail to the work they must perform. We make all types of springs of round or square wire, or of strip, and of any desired material — also wire forms and light stampings. We are large volume producers, yet our organization is built so that it is easy for you to bring your individual problem directly to competent executives, and receive real attention.

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THE RELIABLE SPRING & WIRE FORMS CO. Cleveland 9, Ohio 3167 Fulton Rd.

Representatives in Principal Cities





(Continued from page 341)

understood uses were restricted. Greatest advance in this newest phase of quality controlled production has come as a result of exacting Army-Navy specifications, many of which make x-ray inspection of vital parts mandatory.

"The need for such scrupulous care is evident when one remembers that a single flaw deep inside one tiny casting in the motor of a super-fortress may mean the difference between bringing that crew and plane safely back to its base or losing it to the enemy."

X-ray inspection has been of particular use to the aircraft industry, Mr. Morgan said, with its constant quest for lighter planes to carry heavier loads greater distances.

Indispensable Post War Tool

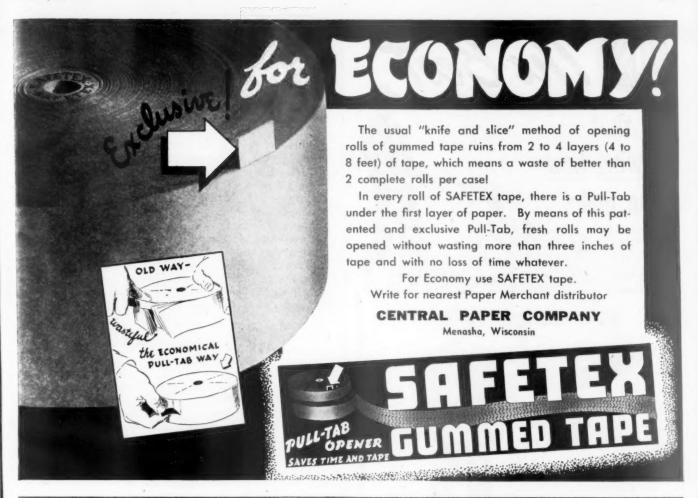
"But every manufacturer," he continued, "is faced with this age-old engineering problem-maximum efficiency, on one hand, and low-cost competitive production on the other. These objectives—frequently diametrically opposed to one another—can be brought down to the last fine point of adjustment, without sacrificing safety or performance, if internal inspection is provided.

"Thus, industrial x-ray becomes not only an available aid—but an indispensable tool—for the manufacturer who views post war competition with realism."

Basic operation of x-ray, Mr. Morgan said, is identical either for medical or industrial applications. In either case x-rays are generated, directed through the object under examination, and the resultant shadow-picture recorded on either a standard 14 x 17-inch film or on a fluorescent screen.

(Continued on page 344)





PUT LOWELL YOUR PLANS

There are all sizes of Reversible Ratchet Wrenches in the Lowell family, even as small as 6 inch in length. If you have problems, or haven't one of our catalogues, write today to the concern that has made a study of and built up this type of wrench.

LOWELLS FOR TOMORROW

Pipe Coupling
Steel Construction
Timber Bolting
Culvert Connecting
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Cable Clamps

Grease Plugs Countersunk Plugs Tunnel Liner Plates Tank Bands R. R. Truck Bolting Water Gates, Etc.

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Lick your gasket problems by sending for this FREE FOLIO. The actual samples of 52 popular Fel-Pro sealing materials contained in this FOLIO make it easy for you to select more efficient gaskets, packing or stripping, Included in the FOLIO are specially developed Fel-Pro materials for sealing water, oil, steam, chemicals, corrosive gases, etc. Also new materials developed and perfected through Fel-Pro's war research.

Write for your FREE FOLIO to-

Write for your FREE FOLIO today . . . then if you can't find the material you're seeking, put your problems up to Fel-Pro's Special Development Staff.

FELT PRODUCTS MFG. CO. 1514 CARROLL AVE., CHICAGO 7, ILL.





APRIL

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To this older process Westinghouse has added miniature radiography. This is the war-born development which makes high-speed inspection possible by photographing the shadow-picture from the fluorescent screen on small-size movie film with an automatic camera. In addition to speeding up operation, this new process requires only about one-fortieth as much film for a given job.

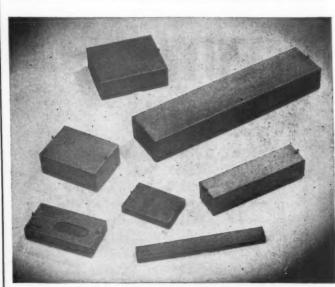
Other Westinghouse industrial x-ray installations serving on the production fronts include one, according to Mr. Morgan, which literally "stops" projectiles within a gun barrel or in piercing armor plate.

Known as the Micronex, this unit, which records its shadow-picture in one one-millionth of a second, enables ordnance experts to study both offensive and defensive characteristics of ammunition with a thoroughness never before attainble.

Although entire output of this equipment now goes to the military services and to their top-priority industries, it will be ready to take on civilian jobs just as soon as hostilities are ended.

HEATING WITH OUTSIDE AIR

A unique method of heating a home by extracting heat from the outdoor air, even when the temperature outside is below freezing, is foreseen as being a definite commercial possibility in the near future and was declared to offer fuel economy and efficiency far surpassing present heating systems, by G. K. Marshall, General Electric air conditioning engineer of Bloomfield, N. J. He said that several installations for this type (Continued on page 346)



MAILING BOXES

Every size and shape, custom-designed for your requirements. Ideal for handling and shipping small repair parts. Our centrally located plant can offer savings on your postwar mailing box needs — plan now.

IRA L. HENRY CO.

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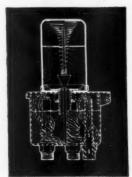
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for Safety

In these days of rationing let's not forget that human life itself is strictly rationed ... one to a person. Accidents in industry alone in 1944 reached the astonishing total of

the protection of men and property against the hazards of accidents and fires in industry can do much in '45 to reducing the above totals. It pays to play safe with safety . . . Justrite.

1,800,000 with 17,500 fatalities. A

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Model 17-S

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Oily Waste Can

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JUSTRITE MANUFACTURING COMPANY 2063 North Southport Avenue, Dept. B-2, Chicago 14, III.

(Continued from page 344)

system were made before the war and are still operating satisfactorily. He spoke before the Lehigh Valley Section, American Institute of Electrical Engineers.

Not only heating but year-around air conditioning is possible with the same equipment employed in this method, explained Marshall. Because the system actually produces heat by making cold air colder, there will be found, he said, many commercial applications where it will be economically advantageous to use both heating and cooling simultaneously. In residences, where both effects are not desired at the same time, the equipment can be made either to heat or cool, and it can be changed from producing one to the other.

Emphasizing the greatly increased output from such a unit, Marshall said that at about 52 degrees F outdoor temperature, it will provide 4 times as much heat as was available in the electricity consumed. Even allowing 15 per cent for transmission losses between the generating station and the home, it will deliver at the 52 degrees F outdoor condition 116 per cent of the heat that was in the fuel burned for supplying energy. Today the best steam generating plants have an overall heating efficiency of approximately 34 per cent.

Basis of the process described is a heat pump, a refrigerating system in which advantage is taken of the heat given off in the process of cooling air rather than of the cooled air itself. In heating, the unit will realize a minimum of 87 per cent fuel efficiency, and under some conditions, the fuel efficiency will exceed 100 per cent, which is better than that which can be obtained with the best domestic automatic fuel burning equipment at the present, Marshall said.

Underlying principle pointing to the possibility of



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Sned in using this reverse cycle refrigeration method for yearround air conditioning, is the scientific fact that there is heat in the air at all times, in frigid winter as well as summer. Reverse cycle refrigeration, or, as it is more commonly called, the heat pump, works on the method of separating this heat in the air from whatever cold there is in the air, adding the heat produced by the electrical energy used to do this work, then piping the result through the house.

In regard to cost of operation, Marshall said, "Using power at 1 cent per kilowatt hour, the heat pump would have the same operating cost as coal at 14 dollars per ton, oil at 10 cents per gallon, manufactured gas at 40 cents per thousand cubic feet or natural gas at 80 cents per thousand cubic feet. This is approximately the picture as it exists today with a heat pump constructed with general purpose refrigeration equipment in a climate such as Pittsburgh and drawing its evaporator heat from the outdoor air. But it can be improved by further development of the equipment or by finding a higher temperature source of heat than outdoor air."

SILICA GEL USED IN PACKING COMMUNICATIONS EQUIPMENT

METHODS of packaging developed by the Army Signal Corps in recent months not only get delicate communications equipment to overseas destinations in good condition but save many thousands of manhours in various war theatres and on the actual battlefronts. This improvement results chiefly from a desiccant

(Continued on page 348)



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Peck SPRINGS & SCREW MACHINE PRODUCTS

APRIL,

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Tough finis! metals

(Continued from page 347)

(drying agent) called silica gel, which enables packaged items to resist moisture even in the most humid and rain-drenched areas of the tropics.

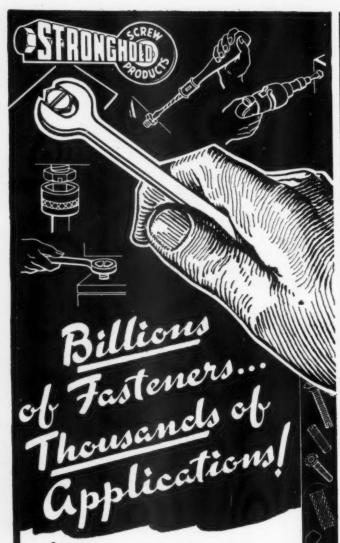
The gel has the appearance of crushed or granulated quartz. It is so porous that a cubic inch has more than 50,000 square feet of absorbing surface; it can take up and hold approximately half of its own weight in water without swelling, caking, or becoming appreciably wet to the touch.

Silica gel has become standard in specifications for packaging Signal Corps equipment for overseas shipmen tin the case of the majority of components and end items. In packaging any given item, one or more bags of the desiccant are inclosed with it. They are placed within a moistureproof sealed wrapping made of plastic or a laminated wrapping composed of paper, metal foil and plastic. The bags range in size from 5 grams to 5 pounds each and for the majority of uses they are made of cotton cloth, although some are of tough paper construction.

An interesting feature of the use of this desiccant is the indicator card which can be inserted into any package to "report" the condition of equipment protected with silica gel. The indicator consists of a small quantity of the gel, treated with cobalt chloride, contained in a manila envelope provided with an acetate window. It takes on a deep blue color when fully activated, but the absorption of moisture changes the color to violet and then to pink. When the maximum amount of water has been absorbed, the indicator shows flesh color.

It is evident that the packaging of Signal Corps equipment in a waterproof and vaporproof package, with a

(Continued on page 350)



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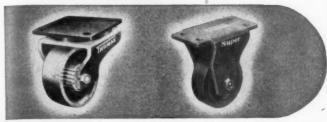
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ARMIDE is a sintered-carbide cutting material which approaches the diamond in hardness. ARMIDE will machine the hardest and toughest steels and sand-filled castings with ease, as well as such heretofore "un-machineable" substances as hard rubber, plastics, and even glass. Because of the extreme hardness of ARMIDE, cutter bits tipped with this material will hold their cutting edge much longer than the finest tool steels and will machine from 10 to 100 times as many pieces between grindings.

ARMIDE-tipped CUTTERS offer special advantages on machining operations involving: (1) Long runs, (2) Sand-filled castings, (3) Tough alloy steels, (4) Machining of hardened parts without annealing and subsequent re-hardening, as in maintenance work, (5) High Speed Machining, (6) Machining of unusual materials.

ARMIDE Carbide Tipped Cutters are designed for use in ARMSTRONG Carbide TOOL HOLDERS. They come in two grades ARMIDE (Red) for machining steel, and ARMIDE (Grey) for machining cast iron, brass, bronze, aluminum and non-metallics. These grades of ARMIDE are distinguished by the corresponding color of the cutter-bit shank.

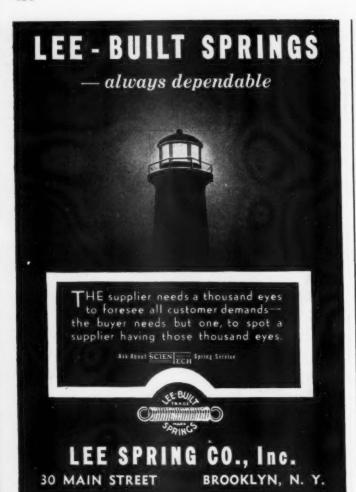
Both ARMIDE (Red) and ARMIDE (Grey) Cutter-Bits come ready-ground in four standard cutter shapes (illustrated below) namely: Right-Hand Turning, Left-Hand Turning, Square Nose Finishing 80° and Round point "V". Both ARMIDE (Red) and ARMIDE (Grey) cutter-bits come with either "Square" or "Heavy Duty" shanks. The shanks of "Square" cutters

have a square cross section. The shanks of "Heavy Duty" cutters are deeper than they are wide in cross section, the added depth compensating for that part of the shank cut away to receive the ARMIDE tip.

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desiccant included, is an expensive and time-consuming operation, but it is much to be preferred to previous methods of preservation, which required dipping components and end items in heavy oils and waxes. The removal of the coatings and the reassembly, frequently done under battle conditions, was awkward and even dangerous. Silica gel makes these operations, both at home and in the field, unnecessary.

BAND SAW BANDS

R UBBER Band Saw Bands are a necessary part of all band saw equipment. The saw blade is an endless band which operates over two wheels—one above and one below the cutting table. An endless rubber band is applied to the face of these wheels to serve as a cushion between the saw and the metal wheel and as a driving medium. It also protects the "set" of the saw teeth.

Band Saw Bands are generally all-rubber construction, 3/16" thick. Wheel sizes range from 12" to 48" in diameter and face widths from 1" to 3". For particular installations there may be other sizes. Some users prefer non-standard thicknesses such as ½", 7/32" or ½".

Bands are built from calendered sheet on drums in the form of sleeves, 15" to 18" wide, and then cut to the required width.

Bands are purposely made shorter than the wheel circumference, since they are applied under tension to afford a ight fit. The amount of such allowances depends on the type of compound used. When ordering, the correct procedure is to specify the wheel diameter and face width, leaving it to our technical department to determine the proper allowance for stretch.

High grade shellac or fish glue are among the most commonly used adhesives. Rubber cement can also be used. However, if proper allowance for stretch is made, the bands perform satisfactorily with just the tension under which they are applied.

Bands with fabric insertion are occasionally requested—although that type is not used to any great extent. In such a construction the size of the band is the same as the wheel circumference, since the fabric insertion prevents stretching in application. This type is mentioned because it might be encountered. It can be furnished if the quantity permits handling on a production basis.

All Band Saw Bands are made to order. The sale of this product is reserved to equipment manufacturers (makers of woodworking machinery who order in large quantities for their original equipment as well as service requirements. Orders for replacement bands from users, should be referred to such sources. (Information Bulletin, B. F. Goodrich Co.)





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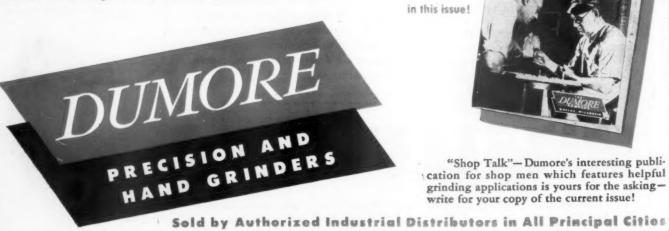
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